

C.E. YI.2/2/1.
Ser. No. 32

RESEARCH LABORATORIES

QUARTERLY PROGRESS REPORT 1.3.60

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Supervising Engineer, Research.

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RESEARCH LABORATORY - WORK PROGRAMMEPREFACE

Upon receipt of a request for development or investigational work, or in certain cases, for some specialised construction, a decision as to whether it is appropriate and practicable for the Laboratories to undertake that work is made. If the work is to proceed, a "Case No." is allotted. Requests originate in the main from the other Sections in the Central Office Engineering Division; some are initiated by Research itself; some are from State Engineering Divisions; others are received from Central Office Divisions or Branches, and, in a few cases from other Departments and Authorities.

The current programme together with a brief indication of the position of each case is given in this Report, the cases being grouped under the names of the Sections making the requests. As it often happens that more than one Section has some interest in a case, cross reference between Sections have been included to draw particular attention to such cases as may be of special interest.

In addition to the individual investigations undertaken in the Laboratories, there are certain standard services provided for the Department as follows :-

- (a) The provision and maintenance of the "General" Electrical Reference Standards.
- (b) The provision and maintenance of the Standard of Frequency for the Department which is used in association with the frequency standards of other Authorities to provide "Standard Time" for the Commonwealth.
- (c) The provision and maintenance of the Telephone Transmission Standard of References and of the associated Instrument Service.
- (d) Technical Information, Patent and Library Service.

Finally, there is the internal service covering the calibration and maintenance of the Laboratories' testing and measuring equipment and the provision of the general facilities required. This occupies the time of an appreciable portion of the staff and is additional to the individual investigations listed on the following pages.

The letters and figures included below the case numbers in the following pages are for local identification purposes within the Laboratories. The Laboratories' file number is shown below the case number while the next line indicates the group engaged on the case, as per table shown on page 3. The last line gives the appropriate file number of the originating section.

NUMERICAL SUMMARY OF CASES FOR THE PERIOD

1.12.59 - 29.2.60

Section	Previous	Added	Closed	Present Current
Engineer-in-Chief	7	-	-	7
Telephone Equipment	36	10	7	39
Lines	33	8	8	33
Supplies	9	6	4	11
Long Line Equipment	7	-	-	7
Telegraphs & Workshops	5	-	2	3
Radio	5	2	-	7
Research	79	2	4	77
Others	27	10	12	25
	208	38	37	209

IDENTIFICATION OF GROUPS

The following two-letter code is used, the first letter identifying the Sub-section and the second the Division within the Sub-section. (The letter A when used in the second place is reserved for those instances where the subject matter is related to the Sub-section as a whole rather than to one of its Divisions).

Sub-section	Identifying Code	Sub-section, Division or Independent Group	Officer March 1960
Radio	RA	Sub-section (General)	E.P. Wright
	RB	Propagation	J.F. Ward
	RC	Frequency Time Standard	E.F. Sandbach
	RD	Equipment Development	E.R. Craig
	RE	Plant Applications	W.E. Beard
	RF	Microwave Techniques	W.H. Otto
	RG	Pulse Techniques	A.J. Seyler
Line Communication	LA	Sub-section (General)	J.C. Wilson
	LB	Telephony	J.M. Bryant
	LC	Multi-channel T & T	A.W. Thies
	LD	Trans. Lines & Computation	R. Buring
	LE	Circuit Theory & Design	E. Rumpelt
	LF	V.F. Transmission	H.S. Wragge
Physical Sciences	MA	Sub-section (General)	P.R. Brett
	MB	Physics	G. Flatau
	MC	Chemistry	G. Walker
	MD	Metallurgy	R.D. Slade
Laboratory Services	SA	Sub-section (General)	A.A. Lorimer
	SB	Engineering Services	R. Pitkethly
	SC	Laboratory Equipment	E.J. Koop
	SD	Information Service	A.M. Collins
	SE	Patents Design and Development	L. Bennett A.H. Baddeley

NUMERICAL INDEX TO CASES

A numerical list of case numbers against page numbers will be found on pages 38 to 42. Whenever possible future issues will contain similar lists including additional details which have been suggested from time to time, such as "Short titles" of Cases, references to R.L. Reports, interest to other Sections, etc.

CURRENT CASES

CASE NO.

ENGINEER-IN-CHIEF

- 2026
YR. 4/17/1
RE
G. 295/15/9
- INVESTIGATE OPERATIONS AND, IF NECESSARY, OVERHAUL THE TANYBRYN - STANLEY RADIO TELEPHONE SYSTEM (Engineer-in-Chief)
Case issued 6/2/56; estimated completion date 31/3/60. Work is complete; a report is being prepared.
- 2066
YR. 2/1/2
RE
- TROPOSPHERIC SCATTER RADIO TRANSMISSION (Engineer-in-Chief)
Case issued 1/12/58; estimated completion date 31/12/60. Awaiting installation. Refer to Case No. 2074 (RE Group).
- 4065
YT. 2/4
LB
- PERFORMANCE ASSESSMENT OF B.P.O. 700 TYPE TELEPHONE (Engineer-in-Chief)
Case issued 24/8/56; estimated completion date 31/3/60. A second final report dealing with objective measurements on samples of the B.P.O. 700-type telephone (equivalent to the A.P.O. 400-type telephone) is in the course of preparation.
- 4129
YT. 2/4/1
LB
- FAULTY PERFORMANCE OF THE ROCKING ARMATURE RECEIVER (TYPE 4T)(E-in-C)
Case issued 28/4/59; estimated completion date 30/6/60. Case 4087 (R.L. Report 5014) refers. The incidence of faults in 4T receivers is apparently high in the case of deliveries from one manufacturer. Two possible causes of faulty operation are under consideration, viz.
- (a) relaxation of strains induced by unsymmetrical heating of the armature during assembly of the receiver;
 - (b) instability due to excessive permanent magnetic flux.
- Both of these causes would result in the commonly observed fault of poling of the armature.
- A method of reclaiming receivers without disassembly is being investigated and shows promise.
- 4135
G. 315/8/170
YR. 5/4
LC
- INTERSTATE TRANSMISSION OF STANDARD FREQUENCY SIGNALS OVER EXISTING TRUNK LINE FACILITIES (Engineer-in-Chief)
Case issued 29/9/59; estimated completion date 30/4/60. In connection with a request to provide standard frequencies with an accuracy of 1 in 10^8 in Adelaide, the potentialities of existing trunk line facilities are to be investigated.
- 4278
YN. 7/8
LC
NS. 5/1/2
YN. 7/8/1
- PROVISION OF AMPLIFIERS ON LONG P.P.E. SUBSCRIBERS' PARTY LINES (Engineer-in-Chief)
Case issued 26/10/54; estimated completion date 31/10/60. Six press-to-talk amplifiers have been constructed and field trials are proving satisfactory. A transistor operated two-band carrier system for operation over earth return trunks has been designed and constructed and has been installed for a field trial on the Normanton to Burketown trunk (Qld.). Transmission is satisfactory, excepting periods of extreme line noise. Additional lightning protection of an extension of the V.F. ringing facility has proved necessary. A generally improved system and a pole-mounted repeater are under development. A ringing regenerator, recovered from a successful field trial at Cann River, has been installed for further field trial in Queensland.
- 6006
L₁
- Engineer-in-Chief (Classified)

CURRENT CASESCASE NO.TELEPHONE EQUIPMENT

- 559
YM. 5/31
MD
TA. 7/6
- TECHNIQUES FOR SATISFACTORY SOLDERING (Telephone Equipment)
Case issued 29.4.54; estimated completion date 30.11.60.
The various soldering tools, methods and materials available are being studied with a view to describing suitable practices for obtaining satisfactorily soldered joints.
- 707
YM. 5/25
MD
TM. 5/5
- PLATING OF 3000 TYPE RELAYS (Telephone Equipment)
Case issued 23.2.55; estimated completion date 30.6.60.
General case to investigate improvements in nickel plating with view to economies and use of alternatives. The quality of the nickel plating is now adequately controlled by the clauses written into Specification TEL 1001 and no trouble should be experienced if these conditions are fulfilled. Zinc and cadmium have been tested as alternatives to nickel. Both give sufficient corrosion resistance and life tests up to 5 million operations were satisfactory, but there is still some doubt about the effect on the operating characteristics. This has been referred to Telephone Equipment Section.
- 722
YM. 5/6
MB
TM. 2/2
- LIFE TESTS ON NO. 6 DRY CELLS (Telephone Equipment)
Case issued 28.2.55; estimated completion date 31.5.60.
Tests were intended to show how much of the capacity of telephone cells is actually used in service and how much is lost due to deterioration. Tests under simulated service conditions have been concluded and results indicate that less than half of the energy that is available on short term discharge is actually delivered when cells are discharged at low intermittent rates the remainder being dissipated by internal discharges. The implications of this in the design of telephone cells are being considered.
- 814
YM. 5/26
MB
TM. 2/11
- INVESTIGATION OF EFFECTS OF SHAPE AND MATERIAL OF ELECTRODES IN AIR GAP PROTECTORS (Telephone Equipment)
Case issued 5.7.55; estimated completion date 31.5.60.
Determination of the relative merits of carbon and metal electrodes and the effect of shape variation on performance. Failure rate with the A.P.O. blade protector is worst with low peak current discharges and the effect of increase in the air gap on the failure rate has been investigated; some increase in reliability has been obtained. A report is being prepared.
- 910
YM. 1/8
MB
TM. 2/24/3
- HIGH RESISTANCE OF SILVER PLATED SWITCH JACK CONTACTS (Telephone Equipment)
Case issued 24.10.55; estimated completion date 30.6.60.
Examination of female 2000 type switch jack from Wooroolin R.A.X. Queensland, showed high contact resistance areas on the tarnished silver surface. Exposure tests made on a variety of contact surfaces indicate that hot dipped and electrodeposited tin surfaces develop less contact resistance at moderate contact pressures than any of the other materials examined. Further tests to assess the value of tin as a contact surface for plug and jack contacts are in hand using standard 16 point plug and jack strips incorporating various coatings and a device for engaging and disengaging the jack in a reproducible manner. Case 1374 also refers.
- 1081
YM. 5/25/1
MB
- DEPOSIT ON 3000 TYPE RELAYS FROM SE. 50 SWITCHES AT ST. LEONARDS EXCHANGE N.S.W. (Telephone Equipment)
Case issued 23.7.56; estimated completion date 31.5.60.
The deposit causing sticking of the armatures of the A relay switches appears to be metal dust and oily soot mixture. The problem of airborne contamination was studied under Case 1153 and Report 5063 has been issued. Experience at Russell Exchange has shown that cleaning the armature gives only temporary relief but that a long term cure is achieved by replacing the residual screws. This is being further investigated.

CURRENT CASESCASE NO.TELEPHONE EQUIPMENT

- 1189
YM.5/19
MB
DIALS AND DIAL CONVERSION KITS (Telephone Equipment)
Case issued 11.4.57; estimated completion date 31.3.60.
Examination and life test of two kits for conversion of No.10 "Slipping Cam" type dials, to observe contact deterioration and standardise test circuit to produce results comparable to 300 type and 400 series telephone circuits. Dials working into artificial long and short lines respectively and one using the 400 series telephone circuit did not show any significant difference in performance after life testing, although contact bounce had developed in some cases. The difference between laboratory tests and actual service appears to be in corrosion, which occurs in service. This is very difficult to reproduce reliably in the laboratory and the better approach would be to seal at least the contacts of dials from foreign matter.
- 1340
YM.5/25/4
MB
SPECIFICATION OF MYLAR AND OTHER SHEET INSULATION (Telephone Equipment)
Case issued 27.5.58; estimated completion date 31.3.60.
To investigate the possibility of modifying the specification for cellulose acetate sheet insulation to cover other materials including "Mylar". Test samples have been submitted to determine the minimum thickness suitable with particular reference to piercing. Work is in progress.
- 1349
YM.5/22
MC
ACID VAPOUR IN SWITCH ROOMS FROM BATTERY CABINETS (Telephone Equipment)
Case issued 11.4.58; estimated completion date 31.3.60.
Sampling has been carried out at Burwood Exchange when batteries were on float and also when given a refresher charge. Other exchanges are to be examined but due to pressure of other work further sampling has been delayed.
- 1432
YM.5/13
MB
SELENIUM AND COPPER OXIDE RECTIFIERS SPECIFICATION (Telephone Equip.)
Case issued 20.10.58; estimated completion date 31.5.60.
Investigation of Departmental requirements of rectifier characteristics with particular reference to transient characteristics and B.P.O. Specification D.2027 and subordinate specifications, in order to produce a better rectifier specification for Australian conditions. Apparatus has been constructed to test rectifiers in accordance with the B.P.O. Specification and the investigation is proceeding.
- 1447
YM.5/26
MB
TM.2/11/5
ANALYSIS OF RESULTS OF FIELD TRIAL OF ERICSSON C.R.ION PROTECTORS (Telephone Equipment)
Case issued 7.11.58; estimated completion date 30.6.60.
Examination of fault statistics and faulty protectors submitted. An interim R.L. Report No.4978 has been issued; covering the results of the first six months of the trial. Further trials are continuing.
- 1499
YM.5/11
MB
RIFA COMBINATION RESISTOR-CAPACITOR SPARK QUENCH UNIT (Telephone Equipment)
Case issued 24.4.59; estimated completion date 31.5.60.
Evaluation of the metallized paper capacitors (which use the resistance of the metal film as the series resistor of the spark quench) to determine their suitability for relay and uniselector spark quench circuits. Tests have been completed and a report is in preparation.
- 1533
YM.1/8
MB
TM.2/12
BELL 59U, INSULATION FAILURE (Telephone Equipment)
Case issued 27.7.59; estimated completion date 31.3.60.
Examination of insulation failure on bell magnet coils and advise on improvements in materials or methods to prevent this type of failure. The investigations are complete and a report is in progress.

CURRENT CASESCASE NO.TELEPHONE EQUIPMENT

- 1542 SWITCHBOARD LAMPS - TUNGSTEN FILAMENT, 48 V 0.05 amp (Telephone Equipment)
 YM. 5/12
 MB.
 TM. 2/10/1
 Case issued 24.8.59; estimated completion date 30.4.60. Life test required on these lamps which have a higher current and power consumption than those tested previously. These lamps are still under life test, but the majority have already failed when removed from the rack for luminosity measurements. It is apparent that they will not withstand vibration in service.
- 1551 JOINTING OF ALUMINIUM BUSBARS USING ELECTRICAL HEATING (Telephone Equipment)
 YM. 2/10
 MD
 TI. 25/4
 Case issued 28.9.59; estimated completion date 30.4.60. Investigate practicability of using electric heating methods for jointing aluminium busbars. Investigations are in hand, although present indications are that the current requirements are too great to make the proposal practical.
- 1556 CATALYTIC BATTERY VENTS (Telephone Equipment)
 YM. 5/22
 MB MC
 TM. 2/177
 Case issued 1.10.59; estimated completion date 31.5.60. Determine efficiency of a patented vent plug which contains a catalyst to recombine the hydrogen and oxygen given off by the cell. The life of the catalyst exposed to poisoning by arsine and stibine which are given off in small quantities by the cell is also to be determined. Tests are in progress.
- 1567 SOLDER FOR HEAT COILS (Telephone Equipment)
 YM. 5/14
 MD
 FM. 2/4
 Case issued 13.11.59; estimated completion date 31.3.60. Determine specification to give suitable solder for heat coils. Tests are proceeding.
- 1571 A.T.E. CROSSBAR SWITCH (Telephone Equipment)
 YM. 5/9
 MB MD
 TN. 15/2
 Case issued 24.11.59; estimated completion date 31.5.60. Examination and tests to determine quality of insulation, metal finish and liability of silver migration of this equipment.
- 1581 TRIAL OF DUST COVERS - CIVIC EXCHANGE (Telephone Equipment)
 YM. 7/5
 MB
 TO. 1/22
 Case issued 14.12.59; estimated completion date 31.5.60. Measurement of dust deposition, temperature distribution and presence of tarnishing agents.
- 1582 FAILURE OF P.V.C. BANK INSULATION (Telephone Equipment)
 YT. 10/7/1
 MB
 Case issued 27.11.59; estimated completion date 31.5.60. Determine reason for failure of P.V.C. Bank insulation which has occurred in exchanges in N.S.W. and W.A. and which appears to be imminent in others. Determine remedial measures.
- 1593 BIMOTIONAL SWITCH WIPERS (Telephone Equipment)
 YM. 5/29/2
 MB
 Case issued 5.1.60; estimated completion date 30.4.60. Study required of wipers 22M in connection with wear of contacts. Such factors as material of manufacture of both wipers and contacts, shape, and variation between different manufacturers to be considered.
- 1594 TARNISH FILMS ON RELAY CONTACTS (Telephone Equipment)
 YM. 5/10
 MD
 Case issued 8.2.60; estimated completion date 30.9.60. Determination of nature and cause of film, and satisfactory methods for removal without dismantling relay.

CURRENT CASESCASE NO.TELEPHONE EQUIPMENT

- 3138 TESTS ON MONOSOL AND BROWLECO SOLDERING IRONS (Telephone Equipment)
 YE.3/8/3 Case issued 9.2.59; estimated completion date 31.3.60.
 SC Two makes of low voltage irons, "Monosol" which has a solder
 TM.2/52D feeding attachment, and a "Browleco", have been tested. Time-
 temperature tests and power measurements have been made on the
 soldering irons and an evaluation of their practical advantages
 and disadvantages in general laboratory usage has been determined.
 A comparison has been made between the "Browleco" (under test")
 and the Scope (previously tested) irons. The investigations have
 been extended to include comparative measurements on a "FICO"
 Pen Iron and also a 12 watt "Oryz" iron. Additional samples of
 miniature irons have been submitted - including Mico, Litesold and
 Fairey; and it is considered appropriate to issue a report on
 the "Monosol" irons only and this is in hand. A separate report
 will be issued on the miniature irons as fresh makes are submitted.
- 3142 PLATE COMPOSITION AND FLOAT CURRENT/VOLTAGE RELATIONSHIPS OF LEAD
 YE.3/8/3 ACID BATTERIES (Telephone Equipment)
 SC Case issued 9.4.59; estimated completion date 30.4.60.
 The investigation covers :
 (a) Float current tests at various float voltages.
 (b) Plate analysis of sample batteries
 (c) Electro-chemical aspects of additives.
- Float current tests at voltages of 2.2, 2.3 and 2.4 volts
 carried out on a wide variety of cells including lead-antimony,
 pure lead and lead-calcium types have indicated that plate
 composition has a marked effect on float currents with float voltages
 of about 2.4 volts/cell. Further confirmatory tests are
 proceeding.
- 3143 CLEANING OF BANK CONTACTS OF BIMOTIONAL SWITCHES (Telephone Equipment)
 YM.5/36 Case issued 23.4.59; estimated completion 30.6.60.
 SE The project covers the following two phases :
 TO.6/59 (i) Design power operated cleaning tool
 (ii) Investigate degree of cleanliness required for
 satisfactory performance and establish best method
 of achieving this cleanliness.
- 4032 TESTER FOR SUBSCRIBERS' TELEPHONE (Telephone Equipment)
 YT.1/7 Case issued 29.8.55; estimated completion date 30.6.60.
 LB The exchange unit has been transferred to Clayton Exchange and the
 TO.4/5 subscribers' telephone tester is undergoing field trials in
 that area. Reports indicate that the principle is sound and the
 instrument is acceptable by faultsmen. An evaluation of the
 performance of the equipment is being made, and, if favourable,
 redesign of the instrument will be undertaken in the light of
 present experience and requirements.
- 4045 AUTOMATIC ELECTRIC TYPE 80 MONOPHONE (Telephone Equipment)
 YT.2/4 Case issued 1.12.55; estimated completion date 30.6.60.
 LB A report on this investigation is now in the course of preparation.
 TM.2/1
- 4051 MEASUREMENT OF DUCT ATTENUATION (Telephone Equipment)
 YX.11/2 Case issued 15.3.56; estimated completion date 30.6.60.
 LB Preparation of a report is proceeding.

CURRENT CASES

<u>CASE NO.</u>	<u>TELEPHONE EQUIPMENT</u>
4073 YT.3/6/2 LB TM.2/19	<u>TRANSMITTER INSET NO.13 MOULDED CASE</u> (Telephone Equipment) Case issued 11.2.57; estimated completion date 31.3.60. A report on the investigation into the apparent deterioration of the plastic-case type Transmitter Inset No. 13 has been prepared and will be issued shortly.
4088 YT.3/6 LB	<u>TRANSMITTER INSET S.T.C. TYPE 4050</u> (Telephone Equipment) Case issued 27.8.57; estimated completion date 31.3.60. A report will be issued shortly.
4090 YT.10/5 LF	<u>DEVELOPMENT OF TRANSISTORISED TONE-GENERATOR AND RING EQUIPMENT</u> (Telephone Equipment) Case issued 9.9.57; estimated completion date 30.6.60. The valve operated P.A.B.X. ring and tone base has been modified to use transistors, and has been handed to Telephone Equipment for trials. A ring and tone machine is being developed to operate from 52 volts which will supply at least 15 watts of ring current. R.L. Reports 4792 and 4854 describe earlier developments.
4130 YT.2/4/1 LB TM.2/1/59	<u>B.P.O. TELEPHONE TYPE 706</u> (Telephone Equipment) Case issued 19.5.59; estimated completion date 30.6.60. A preliminary report has been issued. Further calculations of transmission performance will be made before a final report is prepared.
4132 YT.3/8 LB	<u>RECEIVERS 4T FOR CONTRACT 224.61</u> (Telephone Equipment) Case issued 28.2.59; estimated completion date 31.3.60. First production samples of Aust. production ex S.T.C. Sydney. Performance and durability tests have been completed and a report will be issued shortly.
4139 YT.3/1 LB TM.2/12/5	<u>AUDIBILITY OF MAGNETIC BELLS 1623 WITH 4" and 6" GONGS</u> (Telephone Equipment) Case issued 19.11.59; estimated completion date 30.6.60. Determine the need for 6" gongs. Gongs and movements have been ordered but are not yet to hand.
4140 YT.2/4/1 LB TM.2/19/2 TM.2/1/50	<u>SIEMENS "NEOPHONE" TELEPHONE AND TRANSMITTERS</u> (Telephone Equipment) Case issued 7.12.59; estimated completion date 30.6.60. Comparison with LPO.400 and BPO.706 Telephone and Transmitter 13. An investigation of the transmitters has been made and that of the telephone is proceeding. The transmitter makes use of a gold hemispherical front electrode and carbon of high intrinsic resistance.
4141 YT.4/2 LB TS.4/5	<u>TELEPHONE ANSWERING MACHINE - ANSWERPHONE AND ELECTRONIC SECRETARY</u> (Telephone Equipment) Case issued 20.1.60; estimated completion date 30.6.60. Transmission tests, operating characteristics have been investigated by Circuit Lab. Tests have been completed and two RL. Reports (No.5192 and 5193) issued. A further model of the Electronic Secretary is expected.
4142 YT.4/4 LB TM.2/1/56	<u>ERICOVOK LOUDSPEAKING TELEPHONE</u> (Telephone Equipment) Case issued 17.2.60; estimated completion date 30.6.60. Physical and subjective tests required. General specification for loudspeaking telephones.
4235 YX.9/6 LD TI.1/9	<u>SWITCH PROVISION FORMULAE</u> (Telephone Equipment) Case issued 15.5.53; estimated completion date 30.6.60. Work will proceed soon with the aid of properly engineered equipment based on designs forthcoming from the sponsored post-graduate research work at Melbourne University (see Case No.4077) (Research)

CASE TEMPORARILY DEFERREDCASE NO.TELEPHONE EQUIPMENT

4101
YT.9/1
LB

RE-DESIGN OF TELEPHONISTS' CIRCUIT FOR USE WITH LIGHT-WEIGHT TELEPHONISTS' SETS (Telephone Equipment)

Case issued 19.11.57. Case deferred pending clarification of the requirements.

CASES COMPLETED SINCE PREVIOUS REPORT

1455
YM.5/51
MD
TI.25/11

SOLDER AND SOLDER FLUX EX L.M. ERICSSON (Telephone Equipment)

Case closed. The analysis and tests carried out on solder and solder flux (ex L.M. Ericsson) indicated that they should be satisfactory for use. R.L. Report No.5157 refers.

1494
YM.5/12
MB

MINIATURE LMPS (Telephone Equipment)

Case closed. 48 volt miniature tungsten filament lamps compare favourably with standard size ones, but 5 out of 10 of the 6 volt type failed after completion of 60% of their life test, when removed from their holders. R.L. Report No.5175 refers.

1520
YT.5/9
TN.15/6
MB

L.M. ERICSSON CROSS BAR EQUIPMENT (Telephone Equipment)

Case closed. An examination has been made of a crossbar switch to evaluate the materials and finishes used in its construction. Details are given in R.L. Report No.5194 of the various materials used, and specifications are listed for adequately controlling the quality of similar equipment produced in Australia. The use of silver alloy contact materials in association with phenolic insulation is not favoured because of the danger of silver migration. Full investigations to evaluate the hazard are recommended.

1528
YC.1/8
MC
TO.1/10

CORRODED SWITCH BANKS SANDRINGHAM EXCHANGE (Telephone Equipment)

Case closed. Water of high pH has reached the contacts of the banks causing electrolysis. Extension of the corrosion is possible under conditions of high humidity or if water again reached the contacts but reasonable service is expected under normal exchange conditions at Sandringham R.L. Report No.5167 refers.

1568
YM.5/22
MB
TM.2/177

SAFETY VENTS FOR ENCLOSED CELLS (Telephone Equipment)

Case closed. Samples of explosion proof vents of modified design were examined and found to be most nearly as susceptible to clogging as earlier vents yet they were effectively explosion proof. Rinsing of the polystyrene vents in alcohol after washing in water is not recommended as it increases the susceptibility of the polystyrene to stress-cracking. R.L. Report 5206 gives details.

1590
YM.5/10
MD
TM.2/11

PROTECTOR MOUNTINGS - OUTER SPRING CONTACTS (Telephone Equipment)

Case closed. A contractor proposed using embossed pips on the nickel silver springs instead of silver for the contacts as specified. Examination did not reveal any reason for rejecting the proposal.

3146
YE.3/8/3
SC
TM.2/25

TEST 2 μ fd PAPER CAPACITORS (Telephone Equipment)

Case closed. Two samples of Ducon capacitors were tested in accordance with the requirements of A.P.O. Specification No.409E. Their performance was generally within the specification requirements. Report No.5144 refers.

OTHER CASES OF DIRECT INTEREST TO TELEPHONE EQUIPMENT
SECTION

Section of Progress Report	Case Number
Engineer-in-Chief	4065, 4129, 4135, 4278
Lines	1360, 1522, 1540, 1566
Supplies	(1470) 1561, 3153
Long Line Equipment	4118
Research	540, 710, 1350, 1358, 1374, 1387, 1462, 1465, 1479, 1564, 3505, 4004, 4009, 4057, 4072, 4110, 4185, 7017.
Others:	
Eng. Div. Victoria	(1579) 1589
A.N.S.O. Committee	4109
Methods & Training	3147

Other cases not listed above may also be of general interest.

CURRENT CASES

<u>CASE NO.</u>		<u>LINES</u>
669	<u>WIND LOAD ON POLE LINES</u> (Lines)	
YM.4/4	Case issued 21/12/54; estimated completion date 30/4/60.	
MB	Additional lines have been erected at Mont Park and direct measurements	
LB.1/10	of wind load will be made. So far the maximum wind speeds during	
	the measurements have not exceeded 25 m/h. Results are being	
	evaluated to see whether further measurements are necessary.	
718	<u>SPIRAL TYPE VIBRATION DAMPERS</u> (Lines)	
YM.1/3	Case issued 28/2/55; estimated completion date 31/5/60.	
MB	Accelerated tests under Case 1020 show dampers to be effective in	
LB.9/20	damping artificially induced vibration. Field tests have been	
	completed and the results are being analysed. A report will be	
	issued shortly.	
756	<u>STUDY OF RELATION OF TWIST TO ELONGATION FOR HAND DRAWN COPPER WIRE</u>	
YM.3/1	(Lines)	
MD	Case issued 12/4/55; estimated completion date 31/5/60. Fatigue	
LM.2/61	tests on various wires which failed the lap, twist or tensile tests	
	requirements have now been completed and a report has been written and	
	is being revised as opportunity arises.	
1108	<u>WEATHERING TESTS ON NYLON INSULATORS</u> (Lines)	
YM.1/3	Case issued 7/9/56; estimated completion date 31/3/60. Weathero-	
MB	meter and roof exposure tests to determine comparative weathering	
	resistance of available types of nylon. Further samples will be	
	tested when received.	
1135	<u>VIBRATION OF BRIDGE STRUCTURES IN N.S.W. AND Q'LD.</u> (Lines)	
YM.2/15	Case issued 5/11/56; estimated completion date indefinite.	
MB	Arrangements have been made to record vibrations on selected bridges	
LX.30/3	in N.S.W. and Q'ld. and to analyse the data obtained with a view to	
	correlating this with cable faults on the bridges. Some records have	
	been examined and the results forwarded to the Cable Protection Staff	
	N.S.W., who are now examining records of further tests. No measurements	
	have been made in Queensland to date.	
1233	<u>MATERIAL AND TECHNIQUES FOR JOINTING U.G. PLASTIC INSULATED AND</u>	
YM.2/7	<u>SHEATHED CABLE</u> (Lines)	
MB	Case issued 24/7/57; estimated completion date 31/3/60. Field	
	and laboratory investigation on conductor and sheath joints with	
	particular reference to long term durability of the jointing materials	
	used, serviceability of unsoldered twist joints and moisture pene-	
	tration through sheath. Tests are proceeding.	
1266	<u>OPTIMUM SIZE OF LINE WIRE VIBRATION DAMPERS</u> (Lines)	
YM.3/2	Case issued 9/9/57; estimated completion date 31/5/60. Field	
MB	tests to determine optimum size of line wire vibration dampers.	
	(Case 718 refers.) A report is now being prepared.	
1360	<u>GASES FOR GAS PRESSURE ALARM SYSTEM</u> (Lines)	
YM.2/4	Case issued 30/5/58; estimated completion date 31/3/60. The	
MB	effect of exhausting a 110 cubic feet cylinder of compressed air of	
	"commercial" dryness on a length of small (7 quad) cable was found	
	to have no serious effect on the insulation resistance of the cable,	
	so that the restriction on the use of the last 150 p.s.i. in a cylinder	
	may be removed and the purchase of special "dry" air is unwarranted.	
	The minimum dryness requirements of air for continuous gassing at a	
	constant humidity have been determined and the performance of the	
	"Pure Gas" refrigerator type air dryer measured. Report being prepared.	

CASE NO

LINES

- 1372
YC.1/4
MC
CORROSION OF LEAD SHEATHED CABLES - GENERAL CASE FOR SAMPLES NOT REQUIRING INVOLVED INVESTIGATIONS (Lines)
Case issued 10.6.58; completion date indefinite. The examination of damaged cable sheath to find likely cause of failure. The following investigations have been completed:-
- | | | |
|-----------|---|-------------------------|
| Newcastle | : | R.L. Report 5177 issued |
| Petersham | : | " 5124 " |
| Newtown | : | " 5123 " |
| Kempsey | : | " 5087 " |
| Cessnock | : | " 5195 " |
- 1379
YM.2/14
MC
POLYTHENE SHEATHING FOR UNDERGROUND CABLE (Lines)
Case issued 28.6.58; estimated completion date 31.12.60. To evaluate types of polythene available for cable sheathing regarding resistance to environmental cracking and cold flow. Equipment for environmental cracking test is being constructed.
- 1388
YM.3/4
MB
P.V.C. COVERED AERIAL WIRE (Lines)
Case issued 11.8.58; estimated completion date 30.6.60. To determine the cause of premature cracking and weathering of the P.V.C. insulation of several outdoor wire samples submitted and devise suitable tests to distinguish wires liable to such failure. R.L. Report No.4900 has been issued. Further work on the causes of splitting, recently experienced with drop wire, is in progress.
- 1429
YM.6/18
MB
SAFETY BELTS - LEATHER SUBSTITUTES (Lines)
Case issued 20.10.58; estimated completion date 31.3.60. Poor quality and insidious weaknesses in leather safety belts have made the use of substitutes desirable. The evaluation of the abrasion resistance of four types of belting was requested, and some tests have been made. An abrasion testing apparatus was constructed and the tests have been concluded. R.L. Report No. 5161 has been issued.
- 1438
YM.1/4
MB
SELLING COMPOUNDS FOR WATER BARRIER IN PLASTIC CABLES (Lines)
Case issued 24.10.58; estimated completion date 31.3.60. Examination and test of Behr-Manning Compound EC2630 and compare with "Cablelastic" and advise with respect to specification of compounds for this application. A report has been prepared and will be issued shortly.
- 1480
YM.3/4
MB
LM.2/92
LIFE QUALITY OF P.V.C. DROP WIRE (Lines)
Case issued 23.2.59; estimated completion date 31.3.60. Outdoor and Weatherometer tests on 3 samples from recent production and comparison with faulty samples examined under Case 1388. Tests are in hand.
- 1522
YM.3/1
MD
THE JOINTING OF TELEPHONE WIRES BY COLD WELDING (Lines)
Case issued 3.7.59; estimated completion date 31.5.60. Investigate possibility of joining line wires, both aluminium and copper, by the "cold welding" method. Research has shown that both metals can be joined in this way, and special tools for the purpose are now being constructed. See also Case 1382.
- 1540
YM.2/14
MB
LM.4/401
FAILURE OF 20 PAIR AERIAL CABLE (Lines)
Case issued 20.8.59; estimated date of completion 31.3.60. Investigation of unusual failure of a 20 pair plastic insulated and sheathed cable. Work is complete and a report is in preparation.
- 1550
YM.2/7
MB
LM.2/433
STRESSES IN JOINTING CAPS (Lines)
Case issued 28.9.59; estimated completion date 31.3.60. Measurement of the strain produced in aluminium jointing caps by the compression of the rubber plug between the pressure plates. Some measurements have been completed, but further measurements have been requested and these are now being made.
- 1562
YM.1/3
MB
BUTYL RUBBER INSULATORS (Lines)
Case issued 26.10.59; estimated completion date 30.6.60. Determination of electrical and mechanical properties of sample butyl rubber insulators for comparison with glass insulators.

CURRENT CASES

CASE NO.

LINES

- 1565 FAULTY CABLE SHEATHING EX PADDYS FLAT, N.S.W. (Lines)
YM.2/15 Case issued 14/10/59; estimated date of completion 31/12/59.
MD Determine reason for presence of a number of holes in cable sheathing. Fault is probably due to manufacture. R.L. Report No. 5133 has been issued.
- 1566 TERMINATION OF UNIT TWIN AND QUAD LOCAL TYPE CABLES WITH EPOXY RESIN (Lines)
YM.2/2 Case issued 14/10/59; estimated date of completion 31/3/60.
MC It is desired to extend the termination technique developed for coaxial cables. Preliminary work shows that the same formulation as that used for coaxial cables will be satisfactory, but formulations using non-toxic hardeners will be investigated.
- 1577 PLASTIC CABLE JOINTING - SEALED WIRE JOINT (Lines)
YM.2/7 Case issued 1/12/59; estimated completion date 31/3/60. To test
MC the joint produced for continuity and performance. A report is being prepared.
- 1580 PROTOTYPE HIGH DENSITY POLYTHENE COMBINATION INSULATOR (Lines)
YM.1/3 Case issued 8/12/59; estimated completion date 30/6/60. Fatigue
MB and abrasion tests are required and these will be carried out when
LM.2/65/7 equipment on order is delivered.
- 1585 COAXIAL CABLE JOINTING (Lines)
YM.2/14 Case issued 16/12/59; estimated completion date 31/3/60.
MB Determination of ionisation voltage of Ericsson type joint.
LC.5/6
- 1586 EPOXIDE RESIN JOINTING OF PLASTIC SUBMARINE CABLE FOR TOWNSVILLE - MAGNETIC ISLAND CABLE (Lines)
YM.1/4/1 Case issued 29/12/59; estimated completion date 31/3/60.
MC Involves design of suitable formulations and potting techniques and
LM.2/433/1 testing of the resultant joints. Work is in progress.
- 1591 ENCAPSULATION OF LOADING COIL UNITS IN EPOXY RESIN (Lines)
YM.1/4/1 Case issued 13/1/60; estimated completion date 30/4/60. Object
MC is to produce loading coil units potted in epoxy and thus eliminate
LM.2/96 necessity for bulky metal containers now used. Major difficulty will be the danger to the loading coil insulating and magnetic material from the exotherm of the setting of the epoxy resin. Pressure of other work has prevented a start on this project.
- 1595 DETERIORATION OF PLASTIC INSULATED CABLE (Lines)
YM.2/14 Case issued 11/2/60; estimated completion date 31/5/60.
MB Deterioration of polythene insulated and sheathed cable after water
LX.13/22 has entered the sheath has been reported to occur when pairs are placed in service. Investigation of this and the number of pinholes or incipient faults in new cable sample is required.
- 3381 SERVICE TESTS OF O.D.T. WIRES INSULATED WITH P.V.C. (Lines)
YM.3/4 Case issued 28/2/49; estimated completion date 30/4/60. Tests
MB have been made on batches of samples withdrawn from service. A
LM.4/12 general report covering the characteristics of P.V.C. insulated wire for outdoor use is being prepared and recent faults being investigated under Case No. 1388 (Lines) will be incorporated.
- 4008 HEAVY DUTY ARRESTERS (Lines)
YL.9/1 Case issued 25/2/55; estimated completion date 30/6/60. Steps
LD are being taken to evaluate the performance of trial installations
LR.20/1 and the need to modify the method of application is being examined in the light of new information. More field tests may be required.

CURRENT CASES

CASE NO.

LINES

4105 CROSSINGS OF TELECOMMUNICATION LINES AND HIGH VOLTAGE

YL. 9/3 POWER LINES (Lines)

LD

Case issued 7/1/58; estimated completion date 31/3/60. The results of both scale model measurements and computation show that under open conditions, longitudinal induction in a telecommunication line crossing below a high-voltage power line varies only very slowly as the height of the power line is increased. Induction at a point directly under the power line, however, decreases fairly rapidly. A report is being prepared.

4107 NYLON AND POLYTHENE INSULATORS (Lines)

YM. 1/3

LD

Case issued 17/1/58; estimated completion date 30/4/60. Transmission measurements on nylon and polythene insulators under various exposure conditions, and physical testing of the insulators. This work is further to the preliminary evaluation made under Case 991 (Research Laboratory Report No. 4411) and in conjunction with Case 4108 (Lines). Owing to the dismantling of the Mont Park testing site, the exposure tests have been terminated. A report is being prepared covering the behaviour of the insulators over a period of nearly two years.

4108 NYLON INSULATORS FOR INSPAN TRANSPOSITIONS (Lines)

YM. 1/3

LD

Case issued 17/1/58; estimated completion date 30/4/60. "Condensed line" transmission measurements and physical tests on nylon insulators. Work is supplementary to the preliminary measurements made under Case 1108, and in conjunction with Case No. 4107.

4128 TESTING OF COAXIAL CABLE JOINTS (Lines)

YL. 6/4

LE

LC. 5/6

Case issued 21/4/59; estimated completion date 31/3/60. Coaxial cable joints and terminations made by employing Ericsson rolled sleeve methods and Ericsson jointing material have been tested for their impedance characteristics and mechanical strength. Several rolled sleeve joints have been inserted in type 375 coaxial pairs and their influence on the impedance irregularities of the coaxial pairs has been examined by means of pulse echo tests and found to be satisfactory. The slightly modified method of assembly has not yielded the expected reduction of signal reflections caused by the joints. A report will be prepared shortly.

CASES TEMPORARILY DEFERRED

4112 EARTHING METHODS FOR PROTECTION PURPOSES (Lines)

YL. 9/1

LD

LP. 20/1

Case issued 16/11/49; Case deferred for long term field investigation.

CASES CLOSED SINCE PREVIOUS REPORT

1425 PINHOLE TESTING OF PLASTIC INSULATED CABLE (Lines)

YM. 2/14

MB

Case closed. The suggested "corona test" for pinholes, in which the cable passes through an electrode maintained at 10 - 15 kW and an increase in corona current is detected at a pinhole, will reveal pinholes in small bunches of conductors but is unreliable for cables above about 10 pairs. The test is only a modified version of the standard spark test and has no advantages.

1531 P.V.C. ELECTRICAL TAPES, SCHEDULE C. 7669 (Lines)

YM. 2/7

MB

LM. 2/433

Case closed. Samples of P.V.C. electrical tape were submitted for examination to determine their suitability for cable jointing. The sample of "Scotch 33" was wholly satisfactory and those of "Teraoka" and "Hitachi" departed from specification only in minor respects. R.L. Report No. 5205 refers.

CASES CLOSED SINCE PREVIOUS REPORT

- | <u>CASE NO.</u> | <u>LINES</u> |
|---------------------------------------|---|
| 1560
YM. 5/29
MD
IM. 2/40 | <u>TENSILE TESTS ON CABLE WIRES</u> (Lines)
Case closed. The relationship between stress and strain is given for a number of line constructional materials, for use in calculations associated with the proposed use of plastic sheathed cable in aerial construction. R.L. Report No. 5156 gives details. |
| 1570
YM. 2/4
LX. 90/6/1
MB | <u>EFFECT OF FREQUENCY VARIATIONS ON THE B.T.H. LEAK DETECTOR</u> (Lines)
Case closed. For the mobile (or portable) alternators used to power the B.T.H. leak detector units in the field a frequency deviation of a few cycles per second will not damage the units, but the alternators should, nevertheless, be adjusted to 50 ± 1 c/s when under normal working load. Frequency variations during measurements will cause spurious signals when the frequency is high and loss of sensitivity when the frequency is low. R.L. Report No. 5158 has been issued. |
| 1572
YM. 2/7
IM. 2/433
MB | <u>P.V.C. ELECTRICAL TAPES, SCHEDULE C.8198</u> (Lines)
Case closed. See Case 1571 for details. |
| 1583
YM. 2/4
MB
LX. 90/20/3 | <u>MODEL 500 - "PURE GAS" DEHUMIDIFIER UNIT</u> (Lines)
Case closed. Two units were tested and found to meet the manufacturer's specification. The damage suffered in transit by the units was only minor and did not affect their operation. R.L. Report No. 5185 gives details. |
| 3005
YM. 4/14
SB
IM. 2/429/5 | <u>HOSE COUPLING FOR PNEUMATIC TOOL</u> (Lines)
Case closed. Tests are no longer required on hose couplings as the Department has standardised on the Atlas type which is proving satisfactory in the field. |
| 4136
YL. 4/3
LD
IM. 2/401/1 | <u>TRANSMISSION CHARACTERISTICS OF UNIT TWIN PLASTIC CABLE</u> (Lines)
Case closed. Measurements have been made of the resistance, capacitance and unbalances of a drum length of 75 pair $6\frac{1}{2}$ lb. unit twin plastic insulated cable. R.L. Report 5151 and Addendum No. 1 to R.L. Report No. 3372 refer. |

OTHER CASES OF DIRECT INTEREST TO LINES SECTION

Section of Progress Report	Case numbers
Engineer-in-Chief	4135
Telephone Equipment	559, 3138
Supplies	1512
Long Line Equipment	2014
Telegraphs & Workshops	953
Radio	2072
Research	540, 710, 724, 762, 1056, 1211, 1234, 1257, 1350, 1358, 1382, 1387, 1462, 4072, 4108, (4137), 4288
Others - Auto Plant Townsville Reg. Board	(1526) 1587

CURRENT CASES

CASE NO.

SUPPLIES

- 764
YM. 6/12
MC
MS. 2/245
- SPECIFICATION FOR NITRO-CELLULOSE LACQUER (Supplies)
Case issued 20.4.55; estimated completion date 31.3.60.
A draft specification has been prepared incorporating recommendations by D.S.L. Paint Section. Comments and suggested amendments by Supplies Section have been examined and commented upon. A reply is being awaited before issuing a report.
- 1060
YM. 11/1
MC
MI. 11/1
- OILS AND LUBRICANTS (Supplies)
Case issued 18.6.56; estimated completion date 31.12.61.
Tests with certain lubricants on telephone dials are being conducted. In addition a field experiment using various types of lubricating systems on bimotional switches is being planned in association with Telephone Equipment Section. This test will take several years to complete.
- 1512
YT. 10/11
MB
MI. 3/11
- ATMITE PROTECTOR SCHEDULE C.7668 (Supplies)
Case issued 21.5.59; estimated completion date 31.3.60.
Measurement of surge characteristics of protectors submitted and determine simplest suitable test method for use by testing Laboratories. R.L. Report No. 5112 has been issued and a further report on life testing equipment for all types of protectors will be prepared shortly.
- 1535
YM. 6/1/2
MC
MC. 2/632 (Pt.2) continuing.
- SCHEDULE C.T.B. 1632 - LEAD PAINT AND OIL (Supplies)
Case issued 27.7.59; estimated completion date 30.6.60.
Exposure tests, to determine compliance with specification, are continuing.
- 1561
YM. 6/13
MD
ME. 7/274/1
- CADMIUM PLATING ON COMPONENTS FOR POWER RECTIFIERS - CONTRACT 20045 (Supplies)
Case issued 10.10.59; estimated completion date 31.12.60.
Determine quality of plating on parts delivered to Queensland by McKenzie and Holland and also reasons for deterioration of one part. Further trouble has been experienced in Sydney and additional samples were supplied on 2.2.60. These are now being examined, and it appears that the trouble has been caused by the use of green timber in the packaging.
- 1575
YM. 5/25
MD
- SOFT MAGNETIC IRON EX B.H.P. (Supplies)
Case issued 30.11.59; estimated completion date 30.4.60.
Magnetic properties and analysis of samples ex Heats Nos. 44315, 44316, 31475, 31476, 52991.
Tests completed and verbal advice has been given. A report is being prepared.
- 1584
YM. 1/4/1
MB
MI. 3/409
- FAULTY EPOXY RESIN TERMINATIONS (Supplies)
Case issued 16.12.59; estimated completion date 31.3.60.
Tests to determine reasons for insulation resistance failure.
- 1588
YM. 5/6
MB
SER. 2/23
- "FERBATCO" AIR DEPOLARIZED DRY CELLS (Supplies)
Case issued 30.12.59; estimated completion date 31.12.60.
Test for capacity, service and shelf life. Comparison with No.6 cell (Serial Item 2/0).
- 1592
YM. 1/5
MD
- INSULATOR SPINDLE GAUGE (Supplies)
Case issued 5.4.60; estimated completion date 30.4.60.
Metrological check of thread of insulator spindle gauge.
- 3125
YE. 3/8
SC
- TESTS ON MULTIMETER A.P.O. NO. 2 (C.7713 ITEM 2) AND COMPONENTS (Supplies)
Case issued 15.10.58; estimated completion date 30.4.60.
Tests have been carried out on six production prototypes which were found to be satisfactory. Tests are proceeding on a further three samples of later production and a wide circulation report will be issued for the benefit of users.

CURRENT CASES

CASE NO.

SUPPLIES

3153 TEST PROTOTYPE DUNLOP CELLS (SCHEDULE 8085 CONTRACT 23084) (Supplies)
 YE.3/8/1 Case issued 10.11.59; estimated completion date 30.4.60.
 SC Capacity and float current tests. Samples of 90 μH_r and 200 μH_r
 SER.177/3 submitted were 17% under nominal capacity. Report No. 5166 refers.
 A second sample 200 μH_r cell has been tested and exhibits a
 peculiar behaviour on float charge test. Tests proceeding on
 this. A third sample 200 μH_r cell and a second 90 μH_r cell are
 expected soon for confirmatory tests.

CASES COMPLETED SINCE PREVIOUS REPORT

1470 "MICROCAP" MINIATURE METALLIZED PAPER CAPACITORS (Supplies)
 YM.2/11 Case closed. Samples of "Microcap" miniature metallized
 MB paper capacitors (250 volt working) were submitted to the tests
 of Specification 409E. The pigtails of the 0.1 μF and the 0.5 μF
 did not pass the load test, which is severe for this size of
 capacitor, but were otherwise satisfactory. Four out of six
 samples of the 2.0 μF type failed the electrical breakdown
 test. R.L. Report No. 5160 gives details.

1484 "WATERMARK" FAULT ON N.C. LACQUER (Supplies)
 YM.6/12 Case closed. The development of darkened areas and spots on the
 MC red lacquer used on new vehicles delivered to the Department is
 considered to be due to the reduction to the metallic state of
 the cadmium pigment found to be present. R.L. Report No. 5204
 has been issued.

1573 P.V.C. INSULATED WIRE, A.S.O. COMPOUND VIH/4 (Supplies)
 YM.3/4 Case closed. A sample of P.V.C. insulated drop wire manufactured
 MB by Austral Standard Cables using their compound VIH/4 was tested
 MS.2/323 and the compound found to be satisfactory for insulating multipair
 drop wire and provided suitable pigments are used, it will also
 be satisfactory for the insulation of switchboard wire.
 R.L. Report No. 5189 has been issued.

1578 10 PAIR UNPROTECTED TERMINAL BOXES, CONTRACTS 22994 and 22995 (Supplies)
 YM.1/4/1 Case closed. Samples of epoxy resin cast 10 pair terminal
 MB blocks and boxes from Transmission Products and Trimax
 SER.77/23 Transformers comply with the special conditions of schedule
 C.8048, except for the galvanizing of the boxes from T.P. and
 the terminal plating from Trimax. R.L. Report No. 5183 gives details.

OTHER CASES OF DIRECT INTEREST TO SUPPLIES SECTION

Section of Progress Report	Case Numbers
Telephone Equipment	1189, 1340, 1349, 1432, 1447, 1455, 1484, (1520), 1533, 1542, 1546, (1568) 1571, (1590), 1593, 3138, 3142, (3146) 4132.
Lines	1118, 1233, 1360, 1379, 1388, (1425) 1429, (1531) 1562, (1572), 4107, 4108.
Telegraphs & Workshops	1391
Research	1119, 1211, 1234, 1257, 1350, 1374, 1382, 1387, 1479, 1532, 3100, 3122, 3505
Others : Buildings	1530, 1596
A.N.S.O. Committee	(1409)
Engineering Vic.	1529

Other cases not listed above may also be of general interest.

CURRENT CASES

CASE NO.

LONG LINE EQUIPMENT

- 2014
YR.3/6
RG
DEVELOPMENT OF VIDEO TRANSMISSION TEST SET FOR FIELD APPLICATION (Long Line Equipment)
Case issued 31.5.55; estimated completion date 31.12.60.
This case has been extended to cover the issue of the necessary reports and any work required to assist the Laboratory Services Sub-Section in the current construction of 9 Test Sets.
- 3021
YX.14/3
SC
NL.7/3/1
TESTING LIMITS - TUBES TYPE 328A, 329A (Long Line Equipment)
Case issued 19.2.54; estimated completion date 31.5.60.
Tests have been carried out for about 3 years on a number of tubes withdrawn from plant service as having reached the limit of their service life. Comparative tests have been carried out with a batch of new tubes. The results of these investigations have been analysed and a report is being prepared.
- 3066
YE.3/9
SC
C.R.O. PHOTOGRAPHIC ASSISTANCE IN TESTING NO-BREAK A.C. POWER PLANT (Long Line Equipment)
Case issued 19.6.56; completion date indefinite. A number of different types and makes of no-break A.C. power plants are on order for the Department's power requirements in carrier and telephone exchanges. Tests are to be made on the first delivery of each type. No further checks were required during the last quarter, but the case will be left open awaiting the completion of additional installations.
- 3150
YE.3/8/2
NX.1/4
SC
VML TYPE DECIBEL METER ILE NO.170 (Long Line Equipment)
Case issued 5.10.59; estimated completion date 30.4.60.
A VML type decibel meter submitted by the Long Line Equipment Lab. requires repairs to the attenuator, overhaul of the meter and a general calibration check. These have not yet been commenced due to pressure of other work.
- 4058
YN.7/9
LE
STABILITY FEEDBACK AMPLIFIERS (Long Line Equipment)
Case issued 23.5.56. Case deferred. A concluding report evaluating the test results obtained so far will be written as soon as time is available.
- 4118
YX.14/2
LC
ONE-WAY AUXILIARY REPEATER FOR 12-CHANNEL OPEN WIRE SYSTEMS (Long Line Equipment)
Case issued 29.4.58; estimated completion date 31.12.60.
This development, now designated a "Minor Repeater" to avoid confusion with existing auxiliary repeaters comprises a pole-mounted, silicon transistor operated equipment for amplification of the high frequency direction of transmission only. Two field-trial installations, one at Bacchus Marsh (Vic) and one at Adelaide River (70 miles south of Darwin) were made in early January 1960. Lightning protection for the remote power supply in the N.T. installation has proved inadequate and is being redesigned, otherwise operation so far has been trouble-free.
- 4125
YN.3/5
IC
NS.1/3
DEVELOPMENT AND DESIGN OF A 3 KC/S POLE MOUNTED LINE FILTER SET (Long Line Equipment)
Case issued 21.4.59; estimated completion date 28.2.61.
Following discussions between Long Line Equipment and Research, specifications for a special purpose filter set have been agreed upon. A preliminary model has been set up using ferrite cored inductors. Further development is held up due to a temporary shortage of ferrite core material; resumption of work is expected soon.

OTHER CASES OF DIRECT INTEREST TO
LONG LINE EQUIPMENT SECTION

Section of Progress Report	Case Numbers
Engineer-in-Chief	4135, 4278
Telephone Equipment	910, 1379, 1360, 1447, 1455, 1388, 3138.
Lines	1108, 1233, (1425), 1522, (1531), 4105, 4107, 4108.
Supplies	(1470)
Telegraphs and Workshops	-
Radio	2069, 5007
Research	1211, 1234, 1257, 1358, 1387, 1429, 1462, 1465, 1532, 2002, 2012, 2037, 2058, 2067, 2068, 3022, 4009, 4046, 4048, 4067, 4072, 4134, 4288
Others - Eng. Vic.	1529
Eng. Q'd.	1519

CURRENT CASES

CASE NO.

TELEGRAPHS & WORKSHOPS

- 953 SOLDERLESS WRAPPED CONNECTIONS (Telegraphs & Workshops)
 YM. 5/35 Case issued 20.12.55; estimated completion date 31.3.60.
 MB A Keller Wire Wrapping tool was purchased and sample joints prepared and tested. The tests indicate that primary wrapped joints are quite satisfactory but that secondary wrapped joints are unstable and likely to develop high contact resistance in some circumstances. These results are in conformity with overseas experience and it is evident that equipment containing solderless wrapped connections can be accepted by the Department subject to the usual overall performance specifications.
- 1391 DETECTIONS OF FLAWS IN MACHINES AND TOOLS (Telegraphs & Workshops)
 YM. 4/14 Case issued 11.8.58; estimated completion date 31.12.60.
 MD To survey the methods available for detecting flaws in machines and tools and prepare recommendations of technique to be used in the Departmental Workshops. No action.
 WE. 1/1
- 3151 REPAIR AVO MODEL 8 SERIAL NO. 57763-C-357 (Telegraphs & Workshops)
 YE. 3/8 Case issued 28.10.59; estimated completion date 31.12.59.
 SC Repair and calibrate. The instrument which had been overloaded was overhauled and calibrated. R.L. Report No. 5201 has been issued.

CASES COMPLETED SINCE PREVIOUS REPORT

- 1545 TELEGRAPH REPERFORATOR TAPE. C.T.B. SCHEDULE 1691 (Telegraphs & Workshops)
 YM. 9/1 Case closed. Six tender samples were examined under the conditions of A.P.O. Specification 821. The Rollco sample far exceeded the maximum limits for ash and grit. The other samples failed to conform to the oil content. R.L. Report No. 5178 refers.
 MC
 GE. 3/1
- 1558 TELEGRAPH REPERFORATOR TAPE - TEST CHECK C.T.B. CONTRACT 7627
 (Telegraphs & Workshops)
 YM. 9/1 Case closed. Both samples are considered satisfactory although both slightly exceed the oil content permissible, and one has a lower pH than the minimum specified. R.L. Report No. 5182 refers.
 MC
 GE. 3/1

OTHER CASES OF DIRECT INTEREST TO TELEGRAPHS & WORKSHOPS

Section of Progress Report	Case Numbers
Telephone Equipment	1349, 1432, 1455, 1571, 3138, 3146, 4132
Lines	(1425), 1586, 1591
Supplies	1535, 1584
Research	1350, 1358, 1374, 1387, 1462, 1465, 1479, 1497, 3122
Others - Methods & Train.	3147

Other cases not listed above may also be of general interest.

CURRENT CASES

CASE NO.

RADIO

- 2058 SYDNEY-ORANGE 4000 Mc/s 600 CHANNEL RADIO TELEPHONE SYSTEM (Radio)
 YR.2/1 Case issued 17.11.57; estimated completion date 30.6.60.
 RB The necessity to adopt normal quotation and contract procedure by the N.S.W. Engineering Division for the erection of the tubular steel tower at Kurrajong Heights has delayed the work. The Research team will return to the field immediately the tower is installed. Work will proceed path by path towards Orange.
- 2059 DETERMINE OPTIMUM ABRIAL HEIGHTS AT MADDEN'S PLAINS (N.S.W.) FOR 4000 Mc/s 600 CHANNEL SYSTEM (Radio)
 YR.2/1 Case issued 20.1.58; estimated completion date 31.3.60.
 RB All field work has been completed, results analysed and reports written. R.L. Report No.5184 on Madden's Plains-Bowral will be issued shortly and the others will follow. A theoretical study of the echo pattern found at Wollongong is in progress.
- 2069 PROPAGATION MEASUREMENTS AT 900 Mc/s AND POSSIBLY LATER AT 450 Mc/s BETWEEN MT. BONYTHON, S.A. AND KINGSCOTE KINGAROO ISLAND (Radio)
 YR.2/1 Case issued 10.12.58; estimated completion date 30.6.60.
 RB Extensive field work at both 900 Mc/s and 450 Mc/s was completed in February. One month fading results including frequency diversity effects in the 900 Mc/s region will be taken up to the end of March. Sufficient data will then be available to prepare a report and finalise the project.
- 2072 TESTING OF COAXIAL CABLES INSTALLED AT T.V. TRANSMITTERS, BRISBANE, ADELAIDE, PERTH & HOBART (Radio)
 YR.3/4 Case issued 23.9.59; estimated completion date 30.6.60.
 RG Tests on the coaxial cable installation between the link hut and Transmitter hall at ABQ2 have been completed. (R.L. Report 5130 issued).
 RL.3/6/5 The same measurements were performed at ABS2 (Adelaide), R.L. Report 5163 and ABW2 (Perth) a report of which is in preparation.
- 2078 RADIO PROPAGATION MEASUREMENTS - 4000 Mc/s - HEATON LISMORE N.S.W. (Radio)
 YR.2/1 Case issued 10.2.60; estimated completion date 31.12.60.
 RB
 RT.2/31
- 3157 REPAIR AND CALIBRATION OF FIELD INTENSITY RECEIVER TYPE WX2B (Radio)
 YE.3/8 Case issued 27.1.60; estimated completion date 31.3.60.
 SC Instrument for Radio Section, Brisbane.
- 5007 SUPPLY H.F. QUARTZ CRYSTALS FOR USE IN "RADIO AUSTRALIA" TRANSMITTERS (Radio)
 YR.5/11 Case issued 26.9.55; estimated completion date 30.4.60.
 RE The initial batch of 24 crystals is now complete. Performance tests
 RB.13/10 in the field are required with the crystals in the S.T.C. oscillators, before the case can be closed.

OTHER CASES OF DIRECT INTEREST TO RADIO SECTION

Section of Progress Report	Case Numbers
Engineer-in-Chief	2066, 4135
Telephone Equipment	3138, (3146)
Lines	1566
Supplies	(1470)
Research	1358, 1387, 1462, 1465, 1479, 1564, 2062, 2067, 2068, 2071, 2073, 2074, 2079, 3148, 4134
Others - Eng. Div. Victoria	5026
Eng. Div. Queensland	1519

Other cases not listed above may also be of general interest.

CURRENT CASES

<u>CASE NO.</u>	<u>RESEARCH</u>
540 YM.6/13 MD	<u>CHROMATE PASSIVATION OF GALVANISED COMPONENTS (Research)</u> Case issued 29/3/54; estimated completion date 31/3/60. Samples have been prepared and are now undergoing extensive corrosion tests, which to date indicate that additional protection is given by the passivation treatment.
724 YM.2/15 MD	<u>FATIGUE STRENGTH OF CABLE SHEATHING ALLOYS (Research)</u> Case issued 28/2/55; estimated completion date 31/3/60. Determination of comparative fatigue resistances of pure lead, lead with 0.1% antimony and 1.0% antimonial lead. Experimental work indicates that the fatigue strength increases proportionately to the increase in antimony content although there is a corresponding decrease in grain size which also probably affects fatigue resistance. Some evidence has shown that the fatigue strength of each alloy can be improved by excluding oxygen, indicating that corrosion (or corrosion fatigue) also has an influence. On the basis of experimental results (see previous Q.P.R.) a recommendation has been made that British Standard Lead Sheathing Alloy E be used instead of pure lead for cable sheathing. A draft report has been prepared and is now being amended.
762 YM.6/13 MD	<u>TESTS OF CORROSION PROTECTIVE SURFACES ON IRON (Research)</u> Case issued 14/4/55; estimated completion date 31/8/62. Comprehensive series of tests to determine effectiveness of the various corrosion protectives such as nickel plating, passivated cadmium and zinc phosphating etc. Corrosion tests are proceeding, and further samples are being prepared for outdoor exposure tests. See also Case 540.
1031 YM.5/25 MB	<u>MAGNETIC EFFECTS OF AGING OF RELAY IRON (Research)</u> Case issued 7/5/56; estimated completion date 30/6/60. Tests are in progress to determine the relationship between the length of artificial aging and the magnetic characteristics of relay iron. Effect of various hydrogen annealing and simple annealing treatments prior and subsequent to aging is being studied. A new permeameter has been constructed and tests are proceeding.
1039 YM.5/25 MD	<u>THE AGING OF SOFT MAGNETIC IRON (Research)</u> Case issued 7/5/56; estimated completion date 30/6/60. The study of magnetic and physical hardening with passage of time of locally produced soft magnetic iron. A report is nearing completion but this is held up pending the supply from National Standards Laboratory, Sydney, of some calibrated samples of soft magnetic iron.
1056 YM.4/1 MB	<u>"ALDRIN" AND "DIELDRIN" FOR TERMITE PROTECTION OF CABLE (Research & Lines)</u> Case issued 22/5/56; estimated completion date 31/12/60. Investigation of possible methods of protecting plastic and lead sheathed cables from attack by termites and ants using "Aldrin" and "Dieldrin" (products of Shell Co.) and gammexane. Cable samples in which insecticides have been incorporated were prepared and buried in test plots constructed in areas where attack by termites and ants is prevalent.
1102 YC.1/1 MC	<u>CORROSION INHIBITORS FOR LEAD (Research)</u> Case issued 10/9/56; estimated completion date 30/9/60. In conjunction with Case 1234 inhibitors such as sodium chromate and sodium oleate have been examined and found to be effective only at certain current densities. Interim R.L. Report No. 4889 deals with the corrosion inhibiting power of the alkali salts of naphthenic and resin acids. Work is continuing.

CURRENT CASES

CASE NO.

RESEARCH

1119
YM. 5/28
MD

SURVEY OF FERROUS ENGINEERING ALLOYS (Research)
Case issued 13/9/56; estimated completion date 31/12/60.
Work has been held up temporarily.

1234
YC. 1/1
MC

FUNDAMENTAL RESEARCH ON CORROSION OF LEAD (Research)
Case issued 20/7/57; completion date indefinite. Investigation of fundamental aspects of the corrosion of lead and interrelation of factors such as pH, oxidation-reduction potential, and E.M.F. with particular reference to lead sheathed cable corrosion in soils and waters. The use of sodium chromate and sodium oleate as corrosion inhibitors for lead in saline solutions have been investigated at current densities of 1 and 20 $\mu\text{a}/\text{cm}^2$. When resistive coatings are formed on lead under these conditions, true electrode potentials cannot be measured without some current interruption device. An electronic means for providing this current interruption is being designed by the Laboratory Equipment Division.

1257
YM. 1/10
MC

FUNDAMENTAL RESEARCH ON CORROSION OF IRON (Research)
Case issued 5/9/57; completion date indefinite. Investigation of fundamental aspects of the corrosion of iron with particular reference to corrosion of steel poles in soil. Results obtained have confirmed the work done earlier by Prof. Pourbaix. The equipment used in this work is being redesigned and used for the study of polarisation effects at lead electrodes (see Case No. 1234, Research).

1350
YC. 1/10
MC

EPOXY RESIN PROTECTIVE COATINGS (Research)
Case issued 22/4/58; estimated completion date 31/8/60. To develop a tough shock resistant protective coating for steel work, in particular, corroded steel poles. Comparative tests in the laboratory have shown the superiority of "Epimastic" and a coating developed in the Laboratories over other commercially available products. These two coatings and a neoprene coating have been painted on steel poles in the Mildura area. Tests on further supplies of locally prepared epoxy/coal tar coatings showed all to be inferior to "Epimastic" with the exception of "Epilux 5", which, on a single test plate, performed as well as "Epimastic". Further comparative tests are to be carried out.

1358
YM. 7/5
MB

TEMPERATURE CHARACTERISTICS OF BOXES, CABINETS AND BUILDINGS FOR TRANSISTORISED EQUIPMENT (Research)
Case issued 18/5/58; estimated completion date 31/5/60. The maximum ambient temperature in some areas approaches the maximum operating temperatures for transistors. Characteristics of enclosures exposed to the sun in such areas are therefore critical if transistors are to be used in them. Test facilities were set up at Shepparton and the temperature in a variety of boxes, cabinets and pillars was recorded. These tests have been completed and the results analysed. As it was apparent that shields are necessary to keep the temperatures down, further measurements are being made on the laboratory roof to determine the more important factors in shield design.

1374
YM. 5/10
MD

IMPROVEMENT IN ELECTRICAL CONTACT MATERIAL (Research)
Case issued 12/6/58; estimated completion date 30/6/60. To investigate the metallurgical aspects of the use of tin electrodeposits or hot dip coatings which appear to have better electrical contacting properties than the materials currently used. Switch plugs and jacks have been obtained and coated with tin and are being used to determine the contact properties, particularly after continued plugging in and removal operations. Experimental work is completed and results are being evaluated.

CURRENT CASES

CASE NO.

RESEARCH

- 1382
YM. 2/7
MD
THE JOINTING OF CABLE WIRES (Research)
Case issued 21/7/58; estimated completion date 31/5/60. To investigate the method of jointing cable wire (Engineering Instructions J3300). Joints made by this method are not entirely satisfactory, and a study is being made of means to ensure freedom from noise and continuity of contact. Two very promising methods have been devised and suitable tools are now being constructed to enable comprehensive trials. See also Case 1522.
- 1383
YM. 4/6
MB
DISCHARGE CURRENTS IN LIGHTNING PROTECTORS (Research)
Case issued 29/7/58; estimated completion date 30/6/60. To plan and carry out a field investigation of the discharge currents through lightning protectors on typical lines in co-operation with the Lines Section. Five recording points have been established in Brisbane and Armidale and results are being collected. A report, No. 5127, has been prepared on the results obtained during the past lightning season and will be issued shortly. Further observations are in hand.
- 1387
YM. 6/13
MD
THE PACKAGING OF EQUIPMENT FOR TRANSPORT OR STORAGE (Research)
Case issued 7/8/58; estimated completion date 31/12/60. To prepare report on recommended methods and techniques to ensure adequate protection of equipment against corrosion. A great deal of information has been collected but work has been delayed.
- 1423
YM. 1/4/1
MC
PACKAGING AND DISPENSING OF PRE-MIXED EPOXIDE RESINS AND HARDENERS (Research)
Case issued 10/10/58; estimated completion date 30/6/60. The use of polythene and metal tubes for packaging epoxy resin, plasticiser and hardener for direct injection into cables has been studied. Due to the inability to obtain tubes of sufficient size, attention has been concentrated on blow-moulded polythene bottles. A supply of polythene bottles has been obtained and metal adaptors have been made. A field trial is planned in the next few weeks.
- 1462
YM. 4/14
MD
TEMPERATURE - ITS MEASUREMENT AND CONTROL (Research)
Case issued 9/12/58; estimated completion date 30/4/60. To prepare a comprehensive report on the various methods for measuring and controlling temperature, with particular reference to furnaces, moulding presses etc. Data has been collected and a report is being prepared as opportunity arises.
- 1465
YM. 13/1
MB
ENVIRONMENTAL STABILITY OF PRINTED CIRCUITS (Research)
Case issued 22/12/58; estimated completion date 31/5/60. Test on the long term stability of printed circuits under conditions of high temperature and humidity, with particular reference to insulation resistance and dimensional stability. Special test panels have been prepared and tests have now begun.
- 1479
YM. 2/7
MC
JOINTING OF PLASTIC CABLE (Research)
Case issued 23/2/59; estimated completion date 31/3/60. It would seem that there is a distinct possibility of improving on methods used at present. Two possible methods have been investigated and a report is being prepared.
- 1497
YM. 1/4/1
MC
NON-TOXIC HARDENERS FOR EPOXIDE RESINS IN WORKSHOP APPLICATIONS (Research)
Case issued 16/4/59; estimated completion date 30/6/60. With the problems associated with toxic hardeners (see YM. 1/9) and the arrival of the non-toxic, low viscosity versamid 140, there exists the possibility of replacing toxic hardeners with non-toxic hardeners. Evaluation of Lancast A, Versamid 140 and Hy 956 is in progress.

CURRENT CASES

<u>CASE NO.</u>	<u>RESEARCH</u>
1532 YM. 5/33 MB YL. 3/4	<u>BIAXIALLY STRETCHED POLYTHENE TAPE</u> (Research) Case issued 27/7/59; estimated completion date 31/3/60. Evaluation of the properties of a special insulating tape used in the construction of light weight submarine cable. Tests have been completed and the tape is considered satisfactory. A report is in course of preparation.
1564 YM. 5/10 MD	<u>THE TARNISHING OF SILVER CONTACTS</u> (Research) Case issued 13/10/59; estimated completion date 30/9/60. Investigation of the problem of tarnishing of silver, the materials which cause or aggravate it and methods of cleaning.
1830 YR. 2/1 RB	<u>PROPAGATION RECORD ANALYSIS</u> (Research) Case issued 24/8/50; estimated completion date 30/6/60. The mechanical construction is complete. Further progress awaits the arrival of special counters from the United Kingdom.
2002 YR. 4/2 RE	<u>VICTORIA - TASMANIA V.H.F. RADIO TELEPHONE SYSTEM VIA FLINDERS ISLAND</u> (Research) Case issued 23/2/55; estimated completion date 30/6/60. The work of installing the 6 channel system and increasing its capacity to 12 channels is complete. A report has been prepared and will be issued shortly.
2012 YR. 2/1 RB	<u>900 Mc/s 120 CHANNEL SYSTEM - SELECTION OF THREE SECTION ROUTE</u> (Research) Case issued 31/5/55; estimated completion date 30/3/60. Work is complete but preparation of a report is held up due to other urgent work.
2018 YR. 4/2 RD	<u>DESIGN, DEVELOP AND TEST 200 WATT POWER AMPLIFIER FOR 160 Mc/s WIDEBAND RADIO TELEPHONE SYSTEM</u> (Research) Case issued 5/7/55; estimated completion date 30/6/60. The work is complete; a report is being prepared.
2034 YR. 1/3 RE	<u>IONOSPHERIC FORWARD SCATTER INVESTIGATIONS</u> (Research) Case issued 4/5/56; estimated completion date 31/12/60. The link is in operation. Records are being taken by the C.S.I.R.O. at Camden. A report on the equipment design and construction has been prepared. Some discussions have been held with C.S.I.R.O. officers on the results of signal record analyses with a view to carrying out a programme of telegraph transmission tests.
2037 YR. 4/2 RE	<u>RE-CONSTRUCTION OF FOUR-STACK YAGI AERIALS (160 Mc/s) TO IMPROVE GAIN PERFORMANCE ON THE VICTORIA - TASMANIA R/T SYSTEM VIA FLINDERS ISLAND</u> (Research) Case issued 21/6/56; estimated completion date 30/4/60. The work has been completed and a report is to be prepared.
2045 YR. 5/4 RC	<u>FREQUENCY COMPARISONS BY CARRIER PHASE RECORDING OF G.B.R. TRANSMISSIONS</u> (Research) Case issued 29/3/57; estimated completion date 31/12/60. Recording of GBR signal on 16 kc/s has continued since transmissions of the frequency recommenced early in November, 1958. A 16 kc/s directional aerial using the combined outputs of a wire and a ferrite cored loop is under test. A recorder will also be constructed to compare the A.P.O. frequency standard with an American 18 kc/s standard frequency transmission which is to be stabilised by reference to an atomichron (caesium beam clock).

CURRENT CASES

CASE NO.

RESEARCH

2061 INSERTION OF OBJECTIVE TEST SIGNAL IN TELEVISION TRANSMISSIONS

YR. 3/4 (Research)

RG

Case issued 27/3/58; estimated completion date 30/6/60. The purpose of this work is to investigate the equipment requirements for objective monitoring of the characteristics of television transmission facilities in the presence of picture signals. Using a Pulse and Bar waveform as test signal made it practicable to devise a method of recording continuously the variations of the transmission characteristic of television and other wideband systems. Experimental accessory equipment is being prepared in the laboratory by which the sensitivity of this method may be improved so that even very small variations can be recorded and quantitatively defined with the required accuracy.

2062 CHANNEL CAPACITY UTILISATION OF LONG DISTANCE TV RELAY LINKS

YR. 3/6 (Research)

RG

Case issued 27/3/58; estimated completion date 31/12/60. Complementary to overseas investigations, the Research Laboratories are exploring the possibilities arising from the correlation between successive fields and frames of picture signals in relation to the dynamics of the human sense of vision. A test set-up is in preparation for the investigation of the observer response to changes in the time interval between stroboscopic displays of moving objects and of the parameters affecting the illusion of continuous motion of objects when displayed stroboscopically. The aim of these tests is to find quantitative data for the exchange of motion resolution (number of frames) for spatial detail resolution (number of scanning lines and scanning velocity), both of which determine the required bandwidth (see Res. Lab. Rep. 5064).

2063 TERMINALS AND HALF REPEATER OF 900 Mc/s RADIO BEARER SYSTEM

YR. 4/4 (Research)

RD

Case issued 10/9/58; estimated completion date 30/6/60. Construction is virtually complete and testing will follow.

2064 100 kc/s G.T. CRYSTALS FOR P.F.S. DIVISION (Research)

YR. 5/11

RE

Case issued 16/9/58; estimated completion date 30/6/60. Three pin mounted crystals from B.P.O. type crystal clocks to be wire mounted and sealed. One wire mounted crystal to be resealed. The commencement of this work has been postponed because of higher priority work.

2065 COMPARISON BETWEEN A.P.O. FREQUENCY STANDARD AND S.R.D.E. AMMONIA MASER (Research)

YR. 5/4

RC

RF

Case issued 24/10/58; estimated completion date 30/6/60. Equipment to improve the measuring accuracy of the comparison between the Maser and the 9 Mc/s crystal oscillator has been constructed and is under test. Comparisons using this equipment verify that greater measuring accuracy of the comparison between the 9 Mc/s crystal and the 100 kc/s frequency standard is also desirable to properly measure the Maser performance. Design of the required equipment is proceeding.

2067 INVESTIGATION OF FERRO-MAGNETIC RESONANCE PHENOMENA IN WAVEGUIDES AND STRIPLINES (Research)

YR. 7/9

RF

Case issued 9/12/58; estimated completion date 31/12/60. Measurements are being carried out on a number of microwave ferrites in order to extend their use in reciprocal and non-reciprocal components to lower microwave frequencies.

CURRENT CASES

RESEARCH

CASE NO.

- 2068
YR. 7/9
RF
INVESTIGATION OF PARAMETRIC AND MOLECULAR AMPLIFIERS (Research)
Case issued 9/12/58; estimated completion date 30/6/60. To investigate the suitability of materials such as ferrites and semi-conductors as variable reactances and to provide design data for amplifiers. As a result of initial tests on a parametric amplifier at 858 Mc/s (pumping frequency 2000 Mc/s) work is proceeding on an improved design using a pump frequency of 5000 Mc/s and special Hughes parametric diodes.
- 2071
YR. 3/6
RG
INTERPRETATION OF NON-LINEAR DISTORTION MEASUREMENTS ON TELEVISION CIRCUITS USING C.C.I.R. TEST SIGNAL NO. 3 (Research)
Case issued 24/6/59; estimated completion date 31/3/60. C.C.I.R. test waveform 3 comprises a black-to-white line frequency sawtooth with a 4 Mc/s component superimposed of peak-to-peak amplitude equal to 10% of the composite video signal amplitude. Non-linear gain distortion is at present defined by the ratio of maximum-to-minimum amplitude of the detected 4 Mc/s envelope. The purpose of this work therefore is to investigate the relevance of this criteria to system "gamma" change and grey scale distortion. Experimental equipment is expected to be completed shortly to verify the theoretical reasoning underlying this investigation.
- 2073
YR. 2/1/2
RD
PREPARE RECEIVER FOR TROPOSPHERIC SCATTER PROPAGATION TESTS (Research)
Case issued 30/9/59; estimated completion date 30/9/60. Involves modifications and additions to existing receiver to increase sensitivity. Supply of certain components has delayed completion of this project.
- 2074
YR. 2/1/2
RE
TEST AND INSTAL TROPOSPHERIC SCATTER TRANSMITTER (Research)
Case issued 13/10/59; estimated completion date 30/6/60. Installation is awaiting provision of aerials and cables. Transmitter tests are in progress. The rated power output has been obtained and bandwidth measurements are being taken.
- 2076
YR. 5/11
YR. 3/4
RE
DESIGN AND CONSTRUCTION OF PIEZO-ELECTRIC TRANSDUCERS FOR MERCURY DELAY LINE (Research)
Case issued 7/12/59; estimated completion date 30/6/60. A mercury delay line is required by Pulse Techniques Division. The unit employs piezo-electric transducers for transmission and reception of pulses. Design is in progress.
- 2079
YR. 7/10
RD
DEVELOP AND PROVIDE 2000 Mc/s POWER OSCILLATOR FOR PROPAGATION MEASUREMENTS (Research)
Case issued 8/2/60; estimated completion date 31/7/60. Required to obtain extra system gain for Victoria-Tasmania tests.
- 3017
YE. 3/10
SC
STANDARD R. F. VOLTAGE SOURCE FOR CALIBRATION (Research)
Case issued 6/4/55; estimated completion date 30/6/60. Further work needed to simplify the present complex equipment set-up and to increase the stability of the bolometer bridge D.C. supply to allow the measuring range to be extended down to approximately 20 mV. Work is proceeding on modifications to the bridge to reduce complexity and size of equipment set up.

CURRENT CASES

CASE NO.

RESEARCH

- 3105 MANUFACTURE OF PORTABLE VIDEO TEST SETS (Research)
YR. 3/12 Case issued 1/3/58; estimated completion date 30/6/60. The
SE manufacture of eight portable video test sets for the Department,
plus an additional set for the Australian Broadcasting Control Board,
based on the experimental model designed in the Research Laboratories,
is proceeding. The majority of the components have already been
obtained and the remaining quantities for the additional set approved
are on order. The assembly design of four of the six main units is
complete and the design of the other two is proceeding. A quantity
of two small miscellaneous units have been completed. A pilot
production model of one of the power supply panels has been completed
and tested and final production will commence as soon as drawing
amendments are finalised. Pilot production of the four units is in
progress.
- 3122 POLYSTYRENE CAPACITORS (T.M.C. & DUCON) (Research)
YE. 3/10 Case issued 30/9/58; estimated completion date 30/4/60. The
SC determination of the effects of temperature, humidity and heat aging
on capacitance, the power factor and insulation resistance have been
investigated. Tests have been completed and the results analysed and
tabulated. Pressure of other urgent work has prevented the final
editing and re-arrangement of the report.
- 3148 PROVISION OF 3 AERIAL CARRIAGES WITH AUXILIARY EQUIPMENT (Research)
YR. 2/1 Case issued 28/7/59; estimated completion date 31/3/60.
SB Equipment required for use during a series of propagation measurements
in New South Wales. Most of the items required have been made and
the manufacture of a prototype trolley is in hand.
- 3505 DEVELOPMENT OF SALT FOG TEST CABINET (Research)
YM. 6/13 Case issued 21/11/55; estimated completion date 30/6/60.
SB Required for the testing of metals and of protective surface finishes
in an atmosphere containing salt spray or fog. Although construction
in the Model Shop has been delayed by staff diversion to other more
urgent work, all components have now been manufactured or purchased.
Assembly and fitting will proceed as soon as staff can be allocated
to the work.
- 4004 NEW C.C.I.F. STANDARD OF TELEPHONE EFFICIENCY (A.R.A.E.N.) (Research)
YT. 1/8 Case issued 25/2/55; estimated completion date 30/6/60.
LB Additional equipment to facilitate the study of loaded junctions etc.,
has been completed. Testing of components to determine equaliser
characteristics is proceeding.
- 4009 JUNCTION AMPLIFIERS - DEVELOPMENT AND TRIALS (Research)
YN. 7/7 Case issued 25/2/55; estimated completion date 30/4/60. In
LD conjunction with the Lines Section the characteristics of a loaded
cable between Southport and Tweed Heads installed with special
precautions in regard to mutual capacity and loading tolerances,
have been measured. Preliminary work was embodied in R.L. Report
No. 4532; the results of the Queensland measurements are set forth
and analysed in a R.L. Report which is being prepared.
- 4046 DESIGN OF NOISE MEASURING ATTACHMENT FOR A.P.O. T.M. SET (Research)
YL. 8/1 Case issued 21/12/55; estimated completion date 30/11/61. The
IC attachment is required as an alternative to W.E. 2B noise set and
C.C.I.F. pattern psophometer for use at terminal and repeater stations.
Laboratory development is complete and R.L. Report No. 4544 has been
issued, giving design and performance details. This case is now
awaiting attention by SE Division (Design and Development). A
prototype instrument is in service in the plant. In the meantime
consideration is being given to a transistorised A.P.O. T.M. set
with appropriate facilities for noise measurements.

CURRENT CASES

RESEARCH

CASE NO.

- 4067
YT. 2/9
LF
DEVELOPMENT OF A LONG DISTANCE C.B. TELEPHONE (Research)
Case issued 7/9/56; estimated completion date 30/6/60. Field trial of the two pair L.D. phone described in R.L. Report 4824 is continuing satisfactorily. A prototype developed for single pair operation over at least 5 miles of 4 lb. cable is being rated by immediate appreciation and other tests. Consideration is being given to a loading scheme to suit the 400 series telephone, and also to a telephone to suit standard loading.
- 4092
YT. 1/8/3
LB
TRUNK LINE TRANSMISSION REFERENCE SYSTEM (Research)
Case issued 9/9/57; estimated completion date 30/6/61. Equipment for the provision of time delays in order to simulate echo is on order.
- 4095
YX. 14/2
LF
ELECTRONIC SWITCHING STUDIES (Research)
Case issued 12/9/57; estimated completion date 31/12/60. Experience is being gained in the design of various types of basic logic circuit elements such as shift registers, gating circuits, accumulators etc., which are the main components of electronic computing circuitry. This will find application in digital systems used in data transmission, electronic switching, etc. An automatic dialling machine has been constructed using gas tubes and transistors which will automatically dial any preset number up to seven digits.
- 4110
YT. 1/7
LB
REDIGN OF TELEPHONE EFFICIENCY TESTER (Research)
Case issued 21/1/58; estimated completion date 30/6/60. Drawings are being prepared and are expected to be completed by May, 1960.
- 4134
YL. 4/10
LE
SURFACE WAVE TRANSMISSION LINES (Research)
Case issued 16/7/59; estimated completion date 31/7/60. Preliminary investigation of possibilities for long-distance transmission. Material is being obtained to enable one half-mile of S.W.T.L. to be erected for study of its properties. An 800 yd. length of 200 lb. copper wire coated with polythene has been obtained, a pair of launching horns has been constructed to an experimental design and has been tested, and a line of poles has been erected at the Tullamarine field site.
- 4138
YN. 5/3
LD
TESTS ON FERRITE CORES (Research)
Case issued 10/11/59; estimated completion date 30/6/60. Samples of cores supplied by S.T.C. and by Siemens & Halske are being tested for general loss and hysteresis characteristics.
- 4185
YT. 3/6
LB
DETERIORATION OF NO. 13 TRANSMITTER INSETS (Research)
Case issued 17/1/52; estimated completion date 31/3/60. A report will be issued shortly.
- 4505
YR. 2/2
RF
PRECISION V.H.F. AND U.H.F. MEASURING TECHNIQUES (Research)
Case issued 9/11/51; estimated completion date 30/6/60. The work is complete. A report will be issued shortly.
- 4508
YR. 7/9
RF
LOW NOISE LEVEL MICROWAVE MIXER (Research)
Case issued 7/7/52; estimated completion date 30/6/60. Completion of the work has been delayed because of other work in hand.
- 4515
YR. 4/23
RD
AERIAL DEVELOPMENT AND TEST FACILITIES USING MODEL TECHNIQUES (Research)
Case issued 6/1/54; estimated completion date 31/12/60. Provision of second range for use with aerials working against "earth" is in the design stage.

CASES TEMPORARILY DEFERRED

CASE NO.

RESEARCH

- 710
YM.6/13
MD
TIN ZINC ALLOY ELECTROPLATING (Research)
Case issued 28/2/55. Case deferred.
- 1211
YM.5/31
MD
LOW TEMPERATURE WELDING OF METALS (Research)
Case issued 4/6/57. Case deferred owing to pressure of other work.
- 2006
YR.5/2
RC
IMPROVEMENTS TO LABORATORY FREQUENCY MEASURING FACILITIES (Research)
Case issued 28/2/55. Case deferred, awaiting the provision of a synthesiser which has been ordered from overseas.
- 3002
YM.12/1
SE
MANUFACTURE OF HUMIDITY TEST CHAMBER (Research)
Case issued 28/2/55. Case deferred, awaiting completion of report. No progress due to pressure of other work.
- 3008
YE.4/1
SC
TESTING OF POWER SUPPLY FOR INDUCTION HEATING EQUIPMENT (Research)
Case issued 6/4/55. Case deferred owing to staff shortage.
- 3009
YE.4/1
SC
DESIGN AND CONSTRUCTION OF HIGH POWER R.F. OSCILLATOR FOR INDUCTION HEATING EQUIPMENT (Research)
Case issued 6/4/55. Case deferred owing to staff shortage.
- 3012
YE.4/1
SC
FOUR FREQUENCY AUDIO AND CARRIER COMBINED OSCILLATOR DETECTOR UNITS (Research)
Case issued 6/4/55. Case deferred. An experimental multi-frequency oscillator operating over the range of 50 c/s to 300 kc/s is being developed, but progress is deferred due to pressure of other urgent work and shortage of staff.
- 3013
YE.3/10
SC
PRECISION MEASUREMENT OF ATTENUATION UP TO 200 Mc/s (Research)
Case issued 6/4/55. Case deferred. Development of equipment for measurement up to 40 Mc/s has been completed. Work on extending the range has been deferred pending arrival of scheduled equipment.
- 3022
YM.5/25
SC
ADLAKL RELAY MAINTENANCE (Research)
Case issued 6/4/55. Case deferred owing to staff shortage and pressure of other work.
- 3068
YE.3/10
SC
CAMERA AND EVENT TIMER FOR HIGH SPEED PHOTOGRAPHY (Research)
Case deferred. A basic timing unit has been developed and plans for the construction of a two stage control unit are being prepared prior to passing on for Model Shop construction. Further progress deferred owing to lack of staff and pressure of more urgent work.
- 3100
YE.4/1
SC
DEVELOPMENT OF CAPACITANCE BRIDGE (Research)
Case issued 23/12/57. Case deferred. Final engineering design details have not yet been completed owing to staff transfer and pressure of other work. At present deferred indefinitely.
- 4048
YL.4/2
LC
DESIGN OF V.F. IMPEDANCE RECORDER FOR LINE AND NETWORK MEASUREMENTS (Research)
Case issued 11/1/56. Case deferred. It is believed that a commercial design is now available and appropriate action is being taken.
- 4057
YT.3/10/8
LB
APPLICATION OF NON-LINEAR RESISTORS TO THE DESIGN OF TELEPHONES (Research)
Case issued 29/5/56. Case deferred awaiting the preparation of a report.

CASES TEMPORARILY DEFERRED

CASE NO.

RESEARCH

- 4072 PERMISSIBLE NOISE LEVELS AND METHODS OF MEASUREMENT IN TELEPHONE CONNECTIONS (Research)
YT. 3/6
YL. 8/1
LB Case issued 13/11/56. Case deferred owing to pressure of other work.
- 4077 DEVELOPMENT OF AUTOMATIC TELEPHONE NETWORK ANALOGUE DEVICE (Research)
YX. 9/6
LA Case issued 18/4/57. Case deferred. Required development of electronic traffic generator and devices simulating various parts of the switching system in order to derive solutions, under controlled conditions and at high speed, to various traffic switching problems. Development was carried out by post-graduate students at Melbourne University and final details of these are awaited.
- 4288 NEGATIVE IMPEDANCE LOADING OF TELEPHONE LINES (Research)
YL. 5/2
LF Case issued 29/12/54. Case deferred. To be carried out by post-graduate students.
- 7017 MANUFACTURE OF DEAF AID TELEPHONES (Research)
YE. 2/6
SE Case issued 12/9/58. Case deferred. This work has been deferred because units are being manufactured by Sydney Workshops for the same purpose using a different design.

CASES CLOSED SINCE PREVIOUS REPORT

- 927 PREPARATION OF STANDARD PLATES FOR SPECTROGRAPHIC ANALYSIS OF ALUMINIUM AND IRON (Research)
YE. 4/1
MB Case closed. A suitable quantitative technique using standard alloys has been perfected. R.L. Report No. 4738 refers.
- 2031 MODIFICATION OF 160 Mc/s "MOBILE" RADIO SETS FOR FIELD PARTY COMMUNICATION (Research)
YR. 2/4
RC Case closed. A communication system for parties engaged in field work has been designed using modified mobile radio communication sets. The equipment forms a frequency modulated press-to-talk system with a range of approximately 40 miles and capable of operation from either 230 V. A.C. or 6 V. D.C. R.L. Report No. 5109 has been issued.
- 4133 Research (Classified)
LF Case closed.
- 4137 EFFECT OF FLOODING ON TRANSMISSION PROPERTIES OF PLASTIC CABLE (Research)
YI. 4/3
LD Case issued 10/9/59. Case closed. Capacitance measurements on short sample lengths of plastic insulated cable both dry and water-logged indicate that in the latter condition the effective capacitance may be double that when dry. Report No. 5152 has been issued.

CURRENT CASES

CASE NO.

OTHERS

ATTORNEY GENERAL'S DEPARTMENT

7022 TECHNICAL ASSISTANCE TO ATTORNEY-GENERAL'S DEPARTMENT DURING
YR. 3/2 PERIOD TO 30.6.60 (Attorney General's Department)

SB Case issued 5.8.59; completion date 30.6.60. Case required to allow continuation of the present practice of carrying out miscellaneous small jobs in the Model Shop as requests arise from the Attorney General's Department.

AUSTRAL STANDARD CABLES

5021 PULSE ECHO TEST SET INSTALLED AT AUSTRAL STANDARD CABLES
YR. 3/6 (Austral Standard Cables)

YR. 3/1 Case issued 17.1.58; estimated completion date 30.4.60.
LE Following an improvement of the S.T.C. pulse-testing procedure, Austral Standard Cables no longer require the end terminating network which is now being used for Departmental purposes. A report about design, construction and application of the network is being prepared.

BUILDINGS

1267 PLASTIC MATERIAL FOR POSTMEN'S DELIVERY BAGS (Buildings)

YM. 3/2 Case issued 9.9.57; estimated completion date 31.3.60.
MB Assessment of this glass cloth reinforced plastic as a substitute for leather delivery bags. Exposure tests have terminated and the material found to have weakened badly. A report is being prepared.

1530 NYLON AIRMAIL BAGS (Buildings)

YM. 6/18 Case issued 22.7.59; estimated completion date 29.2.60.
MB Measurements of strength of nylon material submitted for use
BB. 4/8/51 in the construction of airmail bags. The tests have been completed and a report is being prepared.

1596 SCHEDULE C.T.B. 1784, RED POSTMARKING INK (Buildings)

YM. 6/1 Case issued 9.2.60, estimated completion date 31.3.60.
MC For test to specification No. 769.
BB. 4/8/51

3010 WEIGHING OF MAIL MATTER IN FLOW (Buildings)

YE. 4/2 Case issued 6.4.55; initial estimated completion date
SC 30.6.58; (amended date 30.6.60). Delayed until a new sorting
Ga. 44/2946 machine being installed in the Mail Branch is in operation and
G. 225/5/50 any consequent alterations to the design and switching system of
the weighing equipment can be determined. Further progress awaits
advice from Buildings Branch as to suitable time for test.

3119 CALIBRATION OF TWO MULTIRANGE ELECTRICAL INSTRUMENTS (Buildings)

YE. 3/9 Case issued 15.8.58; estimated completion date 30.4.60.
SC Calibration of one six-range ammeter and one G.E.C. eighteen range
volt-ammeter was required. One multi-range meter has been
calibrated, but the calibration of the second meter will be delayed
until some of the more urgent calibration work on hand has been
completed.

C.C.R.R.

2040 INSTALLATION OF N.B.S. ATMOSPHERIC NOISE RECORDER (C.C.R.R.)

YR. 1/3/1 Case issued 28.9.56. The station is functioning satisfactorily.
RB Supplies of spares are being imported from National Bureau of
Standards, U.S.A. to ensure long term continuity of operation.
This is a standing case number.

CURRENT CASES

CASE NO.

OTHERS

DEPARTMENT OF EXTERNAL AFFAIRS

5027 EXPERIMENTAL H.F. RADIO CIRCUIT INTERACTION - SOUTHERN AUSTRALIA
YR.6/7 (Department of External Affairs)
RE Case issued 8.12.58; estimated completion date 30.3.60.
RD.115/7 As a result of the observations on this path the C.T.O. has now
commenced commercial operation. When negotiations with the
Department of External Affairs on disposal of equipment is
finalised the case can be closed.

ENGINEERING, QUEENSLAND

1519 EMBEDMENT OF FERROXUBE INDUCTANCES IN EPOXY RESIN
YM.1/4/1 (Engineering, Q'ld)
MC Case issued 18.6.59; estimated completion date 31.3.60.
TS.47/15 Tests have been completed and R.L. Report No.5107 has been issued.

7024 REPAIR AND CALIBRATION OF FIELD INTENSITY MEASURING RECEIVER
YE.3/8 (Engineering, Q'ld.)
EC Case issued 16.11.59; estimated completion date 31.3.60.
RM.7/1 Instrument for Radio Section Brisbane. The instrument required
extensive repair to the loop connections and attention to all
range switches due to tarnishing of contacts. A new slip ring
assembly has been made and fitted and the instrument overhauled.
The instrument is now ready for calibration.

ENGINEERING, VICTORIA

1529 PROTECTIVE COATINGS FOR LOADING COIL UNITS OF MELBOURNE-MORWELL
YC.1/8 COAXIAL CABLES (Engineering, Vic.)
MC Case issued 22.7.59; estimated completion date 30.4.60.
E-M11/0/3 For suggestion of suitable protective coatings and testing of
trial coated units. The P.V.C. coating on a trial coated unit
was considered to be a poor protective coating. It has been
recommended that a trial coating be made with plasticised coaltar
enamel.

1563 DIECAST TRANSMITTER INSET CASES (Engineering, Vic.)
YM.5/29/1 Case issued 5.11.59; estimated completion date 31.3.60.
MD Tests are proceeding on samples made from Mazak 3 and delivered
under Contract V.3531.

1589 FAULTY RELAY CONTACTS SEBASTAPOL EXCHANGE (Engineering, Vic.)
YM.5/10 Case issued 8.1.60; estimated completion date 30.4.60.
MD To investigate contacts on 3000 type relays at Sebastapol Exchange,
E-MZ2/261/1 Vic., which have required repetitive cleaning.

2077 INVESTIGATE AND CORRECT PERFORMANCE OF B.A.T.E. 60 Kc/s OSCILLATOR
YR.5/11 (Engineering, Vic.)
RE Case issued 7.1.60; estimated completion date 30.4.60.
E-TE.10/1 Oscillator from B.A.T.E. 12 channel system failing in service
causing crystal fracture or frequency instability. Investigation
has commenced.

3149 OVERHAUL GENERAL RADIO COMPONENT BRIDGE SER.No.220 (Engineering, Vic.)
YE.3/3 Case issued 13.8.59; estimated completion date 31.5.60.
SC A General Radio type component bridge requires a general overhaul
and recalibration.

Work has not yet commenced due to pressure of other work.

CURRENT CASES

CASE NO.

OTHERS

3152 CALIBRATION OF EVERETT-EDGUMBE AMMETER-VOLTMETER (Engineering, Vic.)
YE.3/3 Case issued 23.10.59; estimated completion date 31.3.60.
SC The instrument which is required as a sub-standard for calibration of Battery Discharge Panels, has been calibrated and R.L. Report No.5202 has been issued.

3155 CALIBRATE MODEL 7 VOLTMETER, SER. NO. 75369-1-358 (Engineering, Vic.)
YE.3/3 Case issued 29.12.59; estimated completion date 31/3/60.
SC The instrument has been calibrated and R.L. Report No.5199 has been issued.

5026 TELEVISION RECEIVER DETECTION EQUIPMENT (Engineering, Vic.)
YR.3/5 Case issued 28.10.58; estimated completion date 30.6.60.
RD Work complete, including provision of 6 spare aerial units. A report is in course of preparation.

METHODS & TRAINING

3147 DESIGN CABLE JOINTING SLEEVE DISPENSER (Methods & Training)
YM.2/7 Case issued 3.7.59; estimated completion date 30.4.60.
SE A container is required for the holding of a supply of cable jointing sleeves in such a manner as to minimise the time taken by the cable jointer to pick out the sleeves needed. A prototype model which has been tested by Methods and Training is now undergoing modifications at the Research Laboratories.

TELECOMMUNICATIONS

1546 EXAMINATION OF PAPER USED FOR TELEPHONE DIRECTORIES (Telecommunications)
YM.9/1 Case issued 10.9.59; estimated completion date 31.3.60.
MC X-Ray Diffraction examination of the filler is being carried out in attempt to determine reason why some paper causes excessive wear on paper cutting machinery.
G.291/1/73

2007 IMPROVEMENTS TO RADIO INSPECTORS' FREQUENCY MEASURING EQUIPMENT
YR.5/1 (Telecommunications)
RC Case issued 28.2.55; estimated completion date 30.6.60.
G.315/13/49 All work is complete and a report is in preparation.

TOWNSVILLE REGIONAL BOARD

1587 CORROSION OF ELECTRIC CABLE SHEATH (Townsville Regional Electrical Board)
YC.1/4 Case issued 23.12.59; estimated completion date 31/3/60.
MC appears to be due to micro-biological attack followed by acetic acid attack on lead sheath. Work is in progress.

UNIVERSITY OF QUEENSLAND

5024 PREPARATION OF 100 Kc/s GT CUT CRYSTAL (University of Queensland)
YR.5/11 Case issued 17.9.58; estimated completion date 30.4.60.
RE A G.T. plate has been prepared. The crystal is complete and has been delivered. A report is in preparation.

CASES TEMPORARILY DEFERRED

7010 DESIGN AND MANUFACTURE TITLING MACHINE (Finance & Public Relations)
YE.3/9 Case issued 6.2.56.
SB Case deferred pending investigation by Finance and Public Relations into characteristics of a commercial unit, the joint purchase (in conjunction with Drafting Section) of which is being considered.

CASES COMPLETED SINCE PREVIOUS REPORT

CASE NO.

ANSO COMMITTEE

OTHERS

4109 COMPARISON OF DIGITAL AND MIXED ALPHABETICAL-DIGITAL NUMBERING
YT.10/1 SYSTEMS (A.N.S.O. COMMITTEE)

LB Case closed. R.L. Report No.5084 describes the results of tests made indicating that the digital system has certain advantages over the mixed system.

AUTOMOTIVE PLANT

1526 TRAILER MOUNTED HOT WATER SUPPLY UNITS (Automotive Plant)

YM.6/13 Case closed. A method has been recommended for protecting from
MD corrosion the mild steel boilers in the trailer-mounted hot water supply units to be used on the Melbourne-Morwell cable project.

BUILDINGS

1541 AUTOMOBILE LAMPS CONTRACT 7639 (Buildings)

YM.12/5 Case closed. The use of these lamps is not recommended as the
MB values of initial average wattage and initial efficiency are outside
BB.4/2/27 the specified limits. R.L. Report No.5169 gives details.

1554 SCHEDULE C.T.B. 1571 - CANDLES, SOAPS AND MATCHES (Buildings)

YM.7/4 Case closed. All samples conformed to the quality of the
MC original tender samples and are considered satisfactory.
BB.4/8/76 R.L. Report No.5145 and Addendum No.1 refer.

1576 SCHEDULE C.T.B. - SOAP CONTRACT 7594 (Buildings)

YM.7/4 Case closed. Analytical tests performed on these samples yielded
MC results in close agreement with those obtained on the original
tender sample. No grounds for rejection of this soap as an
unsuitable product were established.

ENGINEERING, VICTORIA

1574 PLUGS AND COVERS, CONTRACT 22539 (Engineering, Vic.)

YM.5/16 Case closed. The plugs and covers meet the conditions for impact
MB strength and insulation resistance, recommended in R.L. Report No.4600,
and are considered satisfactory. R.L. Report No.5176 refers.

1579 BATTERY ACID FOR CITY WEST EXCHANGE COMPLIANCE WITH SPECIFICATIONS
YE.3/3 (Engineering, Vic.)

MC Case closed. The iron impurity in the supply of acid for the
E-XP.14/16 assembly of the new City West battery exceeds the specified limit of
TP.2/8 30 p.p.m. as laid down in the Australian Standard Specification C.60.
However B.P.O. findings indicate that this concentration should
not prove injurious in closed type cells. R.L. Report No.5198 has
been issued.

2075 INVESTIGATE CAUSE OF FAILURE IN PILOT TONE OSCILLATOR T.M.C.
YR.5/11 UNA.5/1 (Engineering Vic.)

RE Case closed. Crystals were failing due to excessive drive.
This has been remedied by re-designing the oscillator circuit.
R.L. Report No.5196 gives details.

3154 REPAIR AND CALIBRATE PETBOW FREQUENCY METER (Engineering, Vic.)

YE.3/3 Case closed. A faulty Frequency Meter, Ser. No. 892099 from a
SC Petbow Diesel Generating Set was adjusted to give an accurate
E ME.1/2/1 indication of frequency at 50 cps. (within ± 0.1 cps), at normal
ambient temperature. The accuracy of indication at other frequencies
was regarded as sufficient for the intended usage.
R.L. Report No.5179 refers.

CASES COMPLETED SINCE PREVIOUS REPORT

CASE NO.

OTHERS

3156
YE.3/3
SC
E-XA.20/3

CALIBRATION CHECK OF DECADE RESISTOR BOX (TRANS. PRODUCTS)
(Engineering, Vic.)
Case closed. A decade resistor box, made by Transmission Products, has been calibrated with an estimated accuracy of 0.2% or 0.01 ohms for the Trunking and Switching Division, Victoria. R.L. Report No.5200 gives details.

PERSONNEL

1569
YM.6/18
P.17/3/1
MC

RUBBER AND PVC WATERPROOF CLOTHING SCHEDULE C.8237 and C.8238
(Personnel)
Case closed. Samples of rubber and P.V.C. waterproof clothing submitted under the above schedules have been tested according to the special conditions, and recommendations made as to items considered most satisfactory. R.L. Report No.5191 refers.

PHILIPS ELECTRICAL INDUSTRIES

7023
YA.3/1
SC
V.7503

CALIBRATION OF PHILIPS P817-00 MULTIMETER SER. NO. 841674
(Philips Electrical Industries)
Case closed. A Philips Multimeter type P817.00, used as a reference meter at their service section, has been calibrated at the request of Philips Electrical Industries. R.L. Report No.5138 gives the calibration results.

NUMERICAL INDEX TO CASES

Cases in brackets are in the "Completed List"

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540	Research	MD	23
559	Telephone Equipment	MD	5
669	Lines	LB	12
707	Telephone Equipment	MD	5
710	Research	MD	31
718	Lines	MB	12
722	Telephone Equipment	LB	5
724	Research	MD	23
756	Lines	MD	12
762	Research	MD	23
764	Supplies	MC	17
814	Telephone Equipment	LB	5
910	Telephone Equipment	LB	5
(927)	Research	MB	32
953	Telegraphs and Workshops	LB	21
1031	Research	MB	23
1039	Research	MD	23
1056	Research and Lines	MB	23
1060	Supplies	MC	17
1081	Telephone Equipment	MB	5
1102	Research	MC	23
1108	Lines	MB	12
1119	Research	MD	24
1135	Lines	MB	12
1189	Telephone Equipment	MB	6
1211	Research	MD	31
1233	Lines	MB	12
1234	Research	MC	24
1257	Research	MC	24
1266	Lines	MB	12
1267	Others - Buildings	MB	33
1340	Telephone Equipment	MB	6
1349	Telephone Equipment	MC	6
1350	Research	MC	24
1358	Research	MB	24
1360	Lines	MB	12
1372	Lines	MC	13
1374	Research	MD	24
1379	Lines	MC	13
1382	Research	MD	25
1383	Research	MB	25
1387	Research	MD	25
1388	Lines	MB	13
1391	Telegraphs & Workshops	MD	21
1423	Research	MC	25
(1425)	Lines	MB	15
1429	Lines	MB	13
1432	Telephone Equipment	MB	6
1438	Lines	MB	13
1447	Telephone Equipment	MB	6
(1455)	Telephone Equipment	MD	10
1462	Research	MD	25
1465	Research	MB	25

Case	Originating Section	Division Code	Page
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1479	Research	MC	25
1480	Lines	MB	13
(1484)	Supplies	MC	18
(1494)	Telephone Equipment	MB	10
1497	Research	MC	25
1499	Telephone Equipment	MB	6
1512	Supplies	MB	17
1519	Others - Eng. 'ld	MC	34
(1520)	Telephone Equipment	MB	10
1522	Lines	MD	13
(1526)	Others - Auto Plant.	MD	35
(1528)	Telephone Equipment	MC	10
1529	Others - Eng. Div. Vic.	MC	34
1530	Others - Buildings	MB	33
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1532	Research	MB	26
1533	Telephone Equipment	MB	6
1535	Supplies	MC	17
1540	Lines	MB	13
(1541)	Others - Buildings	MB	36
1542	Telephone Equipment	MB	7
(1545)	Telegraphs & Workshops	MC	21
1546	Others - Telecommunications	MC	35
1550	Lines	MB	13
1551	Telephone Equipment	MD	7
(1554)	Others - Buildings	MC	36
1556	Telephone Equipment	MB MC	7
(1558)	Telegraphs & Workshops	MC	21
(1560)	Lines	MD	16
1561	Supplies	MD	17
1562	Lines	MB	13
1563	Others - Eng. Vic.	MD	34
1564	Research	MD	26
1565	Lines	MD	14
1566	Lines	MC	14
1567	Telephone Equipment	MD	7
(1568)	Telephone Equipment	MB	10
(1569)	Others - Personnel	MC	37
(1570)	Lines	MB	16
1571	Telephone Equipment	MB MD	7
(1572)	Lines	MB	16
(1573)	Supplies	MB	18
(1574)	Others - Engineering Vic.	MB	36
1575	Supplies	MD	17
(1576)	Others - Buildings	MC	36
1577	Lines	MC	14
(1578)	Supplies	MB	18
(1579)	Others - En. Vic.	MC	36
1580	Lines	MB	14
1581	Telephone Equipment	MB	7
1582	Telephone Equipment	MB	7
(1583)	Lines	MB	16
1584	Supplies	MB	17
1585	Lines	MB	14
1586	Lines	MC	14
1587	Others Townsville Reg. Board	MC	35
1588	Supplies	MB	17
1589	Others - Eng. Vic.	MD	34
(1590)	Telephone Equipment	MD	10
1591	Lines	MC	14
1592	Supplies	MD	17
1593	Telephone Equipment	MD	7
1594	Telephone Equipment	MD	7
1595	Lines	MB	14
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2018	Research	RE	26
2026	Engineer-in-Chief	RE	4
(2031)	Research	RC	32
2034	Research	RE	26
2037	Research	RE	26
2040	Others - C.C.R.R.	RE	33
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2059	Radio	RB	22
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2063	Research	RD	27
2064	Research	RE	27
2065	Research	RC & RF	27
2066	Engineer-in-Chief	RB	4
2067	Research	RF	27
2068	Research	RB	28
2069	Radio	RB	22
2071	Research	RG	28
2072	Radio	RG	22
2073	Research	RD	28
2074	Research	RE	28
(2075)	Others - Eng. Vic	RE	36
2076	Research	RE	28
2077	Others - Eng. Vic	RE	34
2078	Radio	RB	22
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3002	Research	SE	31
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3008	Research	SC	31
3009	Research	SC	31
3010	Others - Buildings	SC	33
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3013	Research	SC	31
3017	Research	SC	28
3021	Long Line Equipment	SC	19
3022	Research	SC	31
3066	Long Line Equipment	SC	19
3068	Research	SC	31
3100	Research	SC	31
3105	Research	SE	29
3119	Others - Buildings	SC	33
3122	Research	SC	29
3125	Supplies	SC	17
3138	Telephone Equipment	SC	8
3142	Telephone Equipment	SC	8
3143	Telephone Equipment	SE	8
(3146)	Telephone Equipment	SC	10
3147	Others - Methods & Training	SE	35
3148	Research	SE	29
3149	Others - Eng. Vic.	SC	34
3150	Long Line Equipment	SC	19
3151	Telegraphs & Workshops	SC	21
3152	Others - Eng. Div. Vic.	SC	35
3153	Supplies	SC	18
(3154)	Others Eng. Vic.	SC	36
3155	Others Eng. Vic	SC	35
(3156)	Others Eng. Vic.	SC	37
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Case	Originating Section	Division Code	Page
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4009	Research	LA	29
4032	Telephone Equipment	LB	8
4045	Telephone Equipment	LB	8
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4048	Research	IC	31
4051	Telephone Equipment	ID	8
4057	Research	LB	31
4058	Long Line Equipment	IE	19
4065	Engineer-in-Chief	IE	4
4067	Research	LF	30
4072	Research	LB	32
4073	Telephone Equipment	LB	9
4077	Research	IA	32
4088	Telephone Equipment	LB	9
4090	Telephone Equipment	LF	9
4092	Research	IC	30
4095	Research	IF	30
4101	Telephone Equipment	IE	10
4105	Lines	ID	15
4107	Lines	ID	15
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(4109)	Others - A.N.S.O. Committee	LB	35
4110	Research	LB	30
4112	Lines	ID	15
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4125	Long Line Equipment	IC	19
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4129	Engineer-in-Chief	LB	4
4130	Telephone Equipment	LB	9
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(4133)	Research	LF	32
4134	Research	IE	30
4135	Engineer-in-Chief	IC	4
(4136)	Lines	ID	16
(4137)	Research	ID	32
4138	Research	ID	30
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4141	Telephone Equipment	LB	9
4142	Telephone Equipment	LB	9
4185	Research	LB	30
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5026	Others - Eng. Div. Vic.	RC	35
5027	Others - Dept. of External Affairs	RC	34
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7022	Others - Att. Gen's. Dept.	SB	33
(7023)	Others - Philips Elec. Ind.	SC	37
7024	Others - Eng. Div. 'ld.	SC	34