T800 Series II

Ancillary Equipment

Service Manual

Issue 101

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About This Manual

Scope

This manual contains general, technical and servicing information on T800 Series II ancillary equipment.

Format

We have published this manual in a ring binder so that "revision packages" containing additional information pertaining to new issues of PCBs, or to additional ancillary equipment, can be added as required.

Revision Packages

Revision packages will normally be published when an ancillary equipment manual requires overhaul, or to coincide with the release of information on a new PCB, and may also contain additions or corrections pertaining to other parts of the manual.

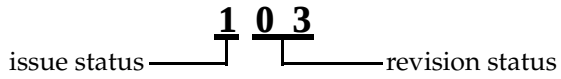
If you return the address card at the front of this manual, you will be notified when revision packages containing new PCB information and/or text are available. You may then order as many packages as you require from your local Tait Company. Revision packages are supplied ready-punched for inclusion in your manual.

Revision Control

Each page in this manual has a date of issue. This is to comply with various Quality Standards, but will also serve to identify which pages have been updated and when. Each page and its publication date is listed in the "List of Effective Pages", and a new list containing any new/revised pages and their publication dates will be sent with each revision package.

Any portion of text that has been changed is marked by a vertical line (as shown at left) in the outer margin of the page. Where the removal of an entire paragraph means there is no text left to mark, an arrow (as shown at left) will appear in the outer margin. The number beside the arrow will indicate how many paragraphs have been deleted.

The manual issue and revision status are indicated by the last three digits of the manual IPN. These digits start at 100 and will increment through 101, 102, 103, etc., as revision packages are published, e.g:



Thus, Issue 103 indicates the third revision to issue 1 and means that three packages should have been added to the manual. The issue digit will only change if there is a major product revision, or if the number of revision packages to be included means that the manual becomes difficult to use, at which point a new issue manual will be published in a new ring binder.

PCB Information

PCB information is provided for all current issue PCBs, as well as all previous issue PCBs manufactured in production quantities, and is grouped according to PCB. Thus, you will find the

parts list, grid reference index (if necessary), PCB layouts and circuit diagram(s) for each individual PCB grouped together.

Errors If you find an error in this manual, or have a suggestion on how it might be improved, please do not hesitate to contact the Technical Writer, Tait Radio Systems Division, Tait Electronics Ltd, P.O. Box 1645, Christchurch, New Zealand.

Technical Information

Any enquiries regarding this manual or the equipment it describes should be addressed in the first instance to your nearest approved Tait Dealer or Service Centre. Further technical assistance may be obtained from the Customer Support Group, Radio Systems Division, Tait Electronics Ltd, Christchurch, New Zealand.

Updating Equipment And Manuals

In the interests of improving performance, reliability or servicing, Tait Electronics Ltd reserve the right to update their equipment and/or manuals without prior notice.

Copyright

Ordering Tait Service Manuals

Service Manuals should be ordered from your nearest Tait Branch or approved Dealer. When ordering, quote the Tait Internal Part Number (IPN) and, where applicable, the version.

Date Of Issue

IPN M800-00-101 T800 Series II Ancillary Equipment Service Manual

Issue 101 published April 1998

Table Of Contents

This manual is divided into three parts as listed below, with each part being further sub-divided into sections. There is a detailed table of contents at the start of each part and/or section.

List Of Effective Pages

The total number of pages in this Manual is 195, as listed below.

Page	Issue Date		Page	Issue Date	
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2	30/04/98		1.7	31/08/96	
3	30/04/98		1.8	31/08/96	
4	30/04/98		1.9	31/08/96	
5	30/04/98		1.10	31/08/96	(blank)
6	30/04/98				
7	30/04/98		2.1	31/08/96	
8	30/04/98	(blank)	2.2	31/08/96	(blank)
			2.3	31/08/96	
			2.4	31/08/96	
Part A			2.5	31/08/96	
			2.6	31/08/96	
I	31/08/96				
II	31/08/96	(blank)	3.1	31/08/96	
			3.2	31/08/96	(blank)
1.1	31/08/96		3.3	31/08/96	
1.2	31/08/96		3.4	31/08/96	
			3.5	31/08/96	
2.1	31/08/96		3.6	31/08/96	
2.2	31/08/96	(blank)	3.7	31/08/96	
			3.8	31/08/96	
3.1	31/08/96		3.9	31/08/96	
3.2	31/08/96		3.10	31/08/96	(blank)
4.1	31/08/96		4.1	31/08/96	
4.2	31/08/96	(blank)	4.2	31/08/96	(blank)
			4.3	31/08/96	
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5.2	31/03/98		4.5	31/08/96	
5.3	31/03/98		4.6	31/08/96	(blank)
5.4	31/03/98	(blank)			
			5.1	31/08/96	
6.1	31/08/96		5.2	31/08/96	(blank)
6.2	31/08/96	(blank)	5.3	31/08/96	
			5.4	31/08/96	
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			6.2	31/08/96	(blank)
I	31/08/96		6.3	31/08/96	
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			6.5	31/08/96	
1.1	31/08/96		6.6	31/08/96	
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7.2	31/08/96	(blank)	8.2.40	31/08/96	(fold-out)
7.3	31/08/96		8.2.41	31/08/96	(fold-out)
7.4	31/08/96		8.2.42	31/08/96	(fold-out/blank)
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			8.2.52	31/08/96	
8.2.1	31/08/96		8.2.53	31/08/96	(fold-out)
8.2.2	31/08/96	(blank)	8.2.54	31/08/96	(fold-out/blank)
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8.2.9	31/08/96				
8.2.10	31/08/96				
8.2.11	31/08/96	(blank)	**Part C**		
8.2.12	31/08/96				
8.2.13	31/08/96	(fold-out)	I	30/04/98	
8.2.14	31/08/96	(fold-out/blank)	II	30/04/98	(blank)
8.2.15	31/08/96				
8.2.16	31/08/96		1.1	30/04/98	
8.2.17	31/08/96	(fold-out)	1.2	30/04/98	(blank)
8.2.18	31/08/96	(fold-out)	1.3	30/04/98	
8.2.19	31/08/96	(fold-out)	1.4	30/04/98	
8.2.20	31/08/96	(fold-out/blank)	1.5	30/04/98	
8.2.21	31/08/96		1.6	30/04/98	
8.2.22	31/08/96		1.7	30/04/98	
8.2.23	31/08/96		1.8	30/04/98	
8.2.24	31/08/96	(blank)	1.9	30/04/98	
8.2.25	31/08/96		1.10	30/04/98	
8.2.26	31/08/96				
8.2.27	31/08/96	(blank)	2.1	30/04/98	
8.2.28	31/08/96		2.2	30/04/98	(blank)
8.2.29	31/08/96	(fold-out)	2.3	30/04/98	
8.2.30	31/08/96	(fold-out/blank)	2.4	30/04/98	
8.2.31	31/08/96		2.5	30/04/98	
8.2.32	31/08/96		2.6	30/04/98	
8.2.33	31/08/96	(blank)	2.7	30/04/98	
8.2.34	31/08/96		2.8	30/04/98	
8.2.35	31/08/96	(fold-out)	2.9	30/04/98	
8.2.36	31/08/96	(fold-out/blank)	2.10	30/04/98	(blank)
8.2.37	31/08/96				
8.2.38	31/08/96				

3.1.1	30/04/98	
3.1.2	30/04/98	(blank)
3.1.3	30/04/98	
3.1.4	30/04/98	(blank)
3.2.1	30/04/98	
3.2.2	30/04/98	(blank)
3.2.3	30/04/98	
3.2.4	30/04/98	
3.2.5	30/04/98	
3.2.6	30/04/98	
3.2.7	30/04/98	
3.2.8	30/04/98	
3.2.9	30/04/98	
3.2.10	30/04/98	
3.2.11	30/04/98	(fold-out)
3.2.12	30/04/98	(fold-out)
3.2.13	30/04/98	(fold-out)
3.3.1	30/04/98	
3.3.2	30/04/98	(blank)
3.3.3	30/04/98	
3.3.4	30/04/98	(blank)
3.3.5	30/04/98	(fold-out)
3.3.6	30/04/98	(fold-out)
3.3.7	30/04/98	(fold-out)
3.3.8	30/04/98	
3.3.9	30/04/98	
3.3.10	30/04/98	
3.3.11	30/04/98	
3.3.12	30/04/98	(blank)

Part A General Servicing Procedures

This part of the manual is divided into the sections listed below. These sections provide some general and advisory information on servicing procedures, a brief history of T800 programming software, and a list of Technical Instructions pertaining to T830 Series equipment.

1 General

If further information is required about any ancillary equipment or this Manual, it may be obtained from Tait Electronics Ltd or accredited agents. When requesting this information, please quote the equipment type number (e.g. T807-10) and serial number. In the case of the Service Manual quote the Tait Internal Part Number (IPN), e.g. M800-00-100, and for circuit diagrams quote the 'Title', 'IPN' and 'Issue'.

1.1 Caution: CMOS Devices

This equipment contains CMOS Devices which are susceptible to damage from static charges. Care when handling these devices is essential. For correct handling procedures refer to the manufacturers' data books, e.g. Philips data books covering CMOS devices, or Motorola CMOS data books, Section 5 'Handling', etc.

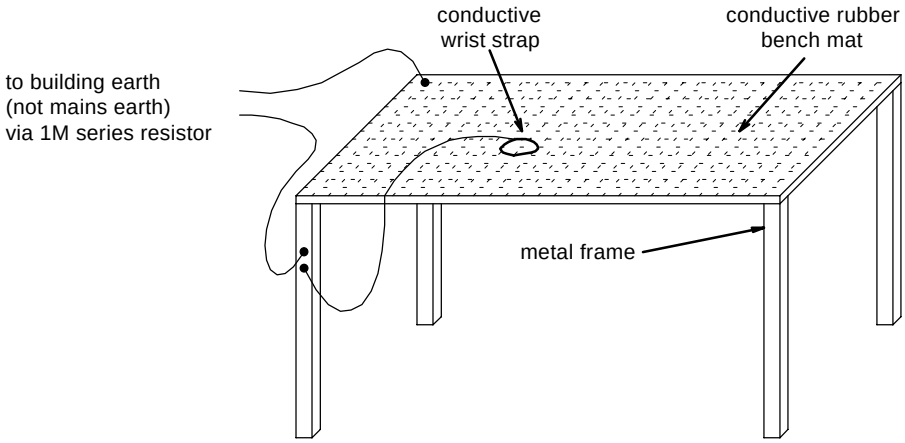

Figure 1.1 Typical Antistatic Bench Set Up

An antistatic bench kit (refer to Figure 1.1) is available from Tait Electronics Ltd under the usual consumable goods ordering system. The kit is held in stock under IPN 937-00000-34 and contains:

- 1 conductive rubber bench mat
- 1 earth lead to connect the mat to ground (c/w 1M series resistor)
- 1 wrist strap
- information leaflet.

1.2 Caution: Beryllium Oxide & Power Transistors

The power transistors in current use all contain some beryllium oxide. This substance, while perfectly harmless in its normal solid form, can become a severe health hazard when it has been reduced to dust. For this reason the power transistors should not be broken open, mutilated, filed, machined, or physically damaged in any way that can produce dust particles.

2 Mechanical

2.1 Pozidriv Recess Head Screws

Pozidriv recess head screws are the preferred standard on all Tait manufactured equipment. The very real advantages of this type of screw will not be realised unless the correct screwdrivers are used by servicing personnel.

2.2 Disassembly/Reassembly

Instructions on disassembly/reassembly for individual equipment are given in the relevant part of this manual.

3 Component Replacement

3.1 Leaded Components

Whenever components are removed from or fitted to a PCB, care must be taken to avoid damage to the track. The two satisfactory methods of removing components from PTH PCBs are detailed below.

Note: The first method requires the use of a desoldering station, e.g. Philips SBC 314 or Pace MBT-100E.

3.1.1 Desoldering Iron Method

Place the tip over the lead and, as the solder starts to melt, move the tip in a circular motion.

Start the suction and continue the movement until 3 or 4 circles have been completed.

Remove the tip while continuing suction to ensure that all solder is removed from the joint, then stop the suction.

Before pulling the lead out, ensure it is not stuck to the plating.

If the lead is still not free, resolder the joint and try again.

Note: The desoldering iron does not usually have enough heat to desolder leads from the ground plane. Additional heat may be applied by holding a soldering iron on the tip of the desoldering iron (this may require some additional help).

3.1.2 Component Cutting Method

Cut the leads on the component side of the PCB.

Heat the solder joint ***sufficiently*** to allow ***easy*** removal of the lead by drawing it out from the component side: do ***not*** use undue force.

Fill the hole with solder and then clear with solderwick.

3.2 Surface Mount Devices

Caution: **Surface mount devices (SMDs) require special storage, handling, removal and replacement techniques. This equipment should be serviced only by an approved Tait Dealer or Service Centre equipped with the necessary facilities. Repairs attempted with incorrect equipment or by untrained personnel may result in permanent damage. If in doubt, contact Tait Electronics Ltd or your nearest Tait Branch or Subsidiary.**

4 To Remove Cased Mica Capacitors

Cased mica capacitors can be removed by heating the top with a heavy-duty soldering iron and gently lifting the capacitor off the PCB with a solder-resistant spike or equivalent.

5 Software History

23/11/89	BASEPROG Version 1
23/08/90	PGM800 Version 2
11/06/91	PGM800 Version 2.01
03/10/95	PGM800 Version 2.21
28/06/96	PGM800Win Version 1.00
18/08/97	PGM800Win Version 2.00

5.1 BASEPROG V1/PGM800 V2

T800 programming software was originally developed as BASEPROG V1 and released as PGM800 V2.

5.2 PGM800 V2.01

The major changes introduced with V2.01 are as follows:

- Full support for different display adaptors.
- Programming of CTCSS frequency data (optional) for individual channels.
- Full cursor control in edit mode.
- User selectable output file format (hex or binary).
- Support for wider range of T800 equipment.
- DOS shell facility implemented.
- CTCSS defeat possible when CTCSS tone is not selected.
- Channel numbering changed from 0-127 to 1-128.
- An "X" included on the printout to indicate that there are 8 switches on the DIP switch and the state of the MSB is dependent on the size of the EPROM used.

Note: The data files produced by BASEPROG V1.0 are still compatible with PGM800 V2.01.

5.3 PGM800 V2.21

PGM800 V2.21 is an updated and expanded version of the earlier PGM800 V2.01 software.

PGM800 V2.21 includes many new and improved features over PGM800 V2.01. There are a number of changes to the user interface to make data entry and editing significantly easier.

Major changes are outlined below:

- Includes several new radio models which are not programmable with PGM800 V2.01.
- Default file names with 'dash' are saved with 'dash' instead of 'underscore'.
- Default file extension in Save File page is BIN instead of HEX.
- Out of range frequencies will result in warning messages, but will still be accepted as valid entries.
- Channel numbers are selectable between 0-127 and 1-128.
- Automatic insertion feature to input frequencies.

Note: The datafiles produced by BASEPROG V1.0 and PGM800 V2.01 are still compatible with PGM800 V2.21.

5.4 PGM800Win V1.00

PGM800Win V1.00 is different in concept from DOS versions of PGM800 in that it is Windows™ driven. It includes many new and improved features over DOS versions of PGM800.

Major changes are outlined below:

- The Windows environment makes data entry and editing significantly easier.
- Includes several new radio models which are not programmable with DOS versions of PGM800.
- Out of range frequencies will result in warning messages and will not be accepted for entry into the standard library module. User defined modules can be created allowing variation from the standard library module.
- Channel numbers default to 0-127 to match the EPROM memory locations, however the user can change the setting so that the channel numbers run from 1-128 to suit his/her particular needs.

Note: The datafiles produced by BASEPROG V1.0 and all DOS versions PGM800 are still compatible with PGM800Win V1.00.

5.5 PGM800Win v2.00

PGM800Win V2.00 is an upgraded and expanded version of PGM800Win V1.0. It has been developed specifically for T800 Series II base stations but also has the capability of programming Series I equipment.

Major changes are outlined below:

- The Windows environment makes data entry and editing significantly easier.
- Includes several new radio models which are not programmable with DOS versions of PGM800.
- Out of range frequencies will result in warning messages and will not be accepted for entry into the standard library module. User defined modules can be created, allowing variation from the standard library module.
- Channel numbers default to 0-127 to match the EPROM memory locations, however the user can change this setting so that the channel numbers run from 1-128 to suit his/her particular needs.
- The ability to program T800 Series II base station modules via serial communications.
- Deviation and reference modulation settings are written automatically to the radio.
- Extra information that is not stored in the radio (but is information relevant to the radio) can be saved to a file on disk (e.g. note field, auxilliary pin names etc).

Note: The datafiles produced by BASEPROG V1.0. all DOS versions of PGM800 and PGM800Win V1.0 are still compatible with PGM800Win V2.00.

6 Technical Instructions

From time to time Technical Instructions (TIs) are issued by the Radio Infrastructure Engineering Division of Tait Electronics. These TIs may be used to update equipment or information, or to meet specific operational requirements.

TIs applicable to specific T800 Series ancillary equipment are listed in the relevant part of this manual.

