



LONG FIELD ACADEMY

# Policy and Procedure: PAT Testing

**Date:** **April 2014**

**Senior Team Responsibility**

**Governors' Reviewing Committee** **FRHP**

**Reviewed:** **Feb 2017**

**Review date:** **Feb 2018**

**Associated Documentation:** **Health & Safety Policy**

## 1. INTRODUCTION

The Academy has a legal obligation to carry out, on a regular basis, electrical testing to all electrical equipment and installations. Such testing is a requirement of the Electricity at Work Regulations 1989 that are made under the Health and Safety at Work, etc Act 1974.

It is the responsibility of the Managers to ensure the testing of all portable electrical appliances within areas under their control.

The definition of portable appliances includes all electrical or electronic items that are connected to a single phase 230 volt 50 Hz main supply via a user removable plug, (typically a 13 amp fused square pin (BS1363)) and flexible lead.

Appliances such as cookers that are permanently connected are not deemed to be portable electrical appliances, and should be tested as part of the fixed wiring installation and/or maintained under a specific service contract.

## 2. POLICY

It is the responsibility of Managers to ensure that a full inventory of all portable electrical appliances within the areas under their control is maintained (See Appendix A - PAT Inventory)

2. All electrical items covered by Portable Electrical Appliance (PAT) Testing must be tested on a regular basis by a certified competent person.

3. Each PAT tested item must be labelled with the date of the latest test and the initials of the competent person. The results of the PAT tests must be registered and kept with the specific H&S Action Plan within The Action Manager (TAM).

4. Any item failing its required PAT test **must be withdrawn from service immediately** and not re-used until the fault(s) have been rectified and it has been re-tested and successfully passed the PAT retest.

5. All new electrical items must be recorded before use, be clearly marked by the manufacturer as to their conformity with recognised standards (CE), tested within the warranty period and regularly thereafter. All second hand items must be tested before use and regularly thereafter.

6. Those carrying out inspection and tests must be competent to undertake the inspection, and where appropriate, testing of electrical equipment and appliances, having due regard to their own safety and that of others. The Tester must be able to recognise electrical, mechanical or thermal damage to electrical equipment and appliances and their flexes/cables which may be encountered in any environment.

7. All staff must inform their Manager of all and any electrical equipment brought into the office/establishment/site.

### 3. WHAT IS INCLUDED?

The definition of portable appliances includes all electrical or electronic items that are connected to a single phase 230 volt 50 Hz main supply via a user removable plug, (typically a 13 amp fused square pin (BS1363)) and flexible lead.

There are a small number of portable electrical appliances for specialist purposes that are connected to a single/three phase 50/110/230/400 volt 50Hz main supply via an industrial type removable plug (typically un-fused ingress protected round multi pin (BS4343 (BS EN 60309-2) industrial plugs/sockets) and flexible lead.

The word portable applies to the connection to the electrical supply not whether the item is itself portable. Therefore appliances such as cookers that are portable but are permanently connected are not deemed to be portable electrical appliances, and should be tested as part of the fixed wiring installation and/or maintained under a specific service contract.

The Following points (a – i) have been included to address frequently asked questions on this subject:

#### **a) Notes**

1. All electrical items regardless of ownership are included in these Regulations. Therefore this includes personally owned items used in work locations and items loaned from other departments and/or external agencies.

2. Portable mains extension leads are separate electrical items and must be tested independently of the item to which they are connected.

3 Electrical items owned by residents in residential accommodation are subject to this policy.

4. The manager may forbid the use of personal and loaned electrical equipment for any of the following reasons:

- Has not been tested
- Is considered a hazard in the location or circumstances of use, or
- Is not considered to be essential to the running of the area

These steps must be taken to ensure that the Academy's public liability insurance is not invalidated.

(Please note that while the Academy's insurance normally covers the consequences of an accident resulting from the use of equipment with its knowledge and consent, the loss of private equipment by fire or theft is not covered and requires private insurance.)

5. The only electrical items excluded are those, which operate solely on batteries (for example, calculators and radios), or low voltage (for example some computer peripherals, laptops, telephones and modular electronic units). However if a low

voltage item has a 230 volt external power supply then its power supply is covered by these regulations.

### **b) Home working**

Wherever possible staff are encouraged to use the Academy facilities, but some staff carry out elements of their work away from their main office base, sometimes at home. In most cases at home staff are likely to use their own equipment including computers and it is in their own interests to ensure it is in a good, safe condition. They can do this by carrying out simple user checks before they start work.

Occasionally equipment is bought by the Academy specifically for use by staff at home. This electrical equipment should be logged on the PAT testing inventory and inspected and tested in accordance with the appropriate frequency intervals for other similar equipment.

### **c) Heaters**

It should be noted that use of portable heaters is usually only permitted as a temporary measure, and open element and Calor gas fires are prohibited for fire safety reasons. Any portable electrical heaters must have a thermostat and their use must be kept to a minimum. Only heaters provided by the academy should be used, and then only after consultation with, and agreement by Facilities Management.

### **d) Legislation**

All work with or involving the use of equipment powered by electricity at the ACADEMY is subject to the following UK legislation:

1. The Health & Safety at Work , etc Act (1974) (HASAWA 1974)
2. The Electricity at Work Regulations (1989) (EAWR 1989)
3. The Provision and Use of Work Equipment Regulations(1992) (PUWER 1992)

The latter in particular sets out the requirements for the provision and recording of associated maintenance works (in accordance with manufacturers recommendations).

### **e) Levels of Responsibility**

Managers are responsible for ensuring that they maintain an inventory (See Appendix A - PAT Inventory) of portable electrical equipment and ensuring that such equipment is checked, inspected and tested in accordance with this policy by a competent person.

A Competent Person is someone with sufficient qualifications, knowledge and experience, who has been nominated to carry out PAT inspection and testing.

A suitably trained person is someone with sufficient training and experience to carry out simple visual checks of portable electrical appliances and leads.

### **f) Training/Experience/Capability**

A **Competent Person** can carry out combined inspection and testing of portable electrical appliances and leads.

A Competent Person will have obtained a Certificate of Competence after successfully attending the course for the Inspection and Testing of Electrical Equipment (C&G 2377/002) at a college.

The Competent Person will be able to carry out visual inspections, simple dismantling of plugs etc where it is necessary for testing, use testing equipment, record results and recognise faults. They will be able to identify equipment and appliance types to determine the test procedure and frequency of inspection and testing.

They will be familiar with test instruments used and, in particular, their limitations and restrictions so as to achieve repeatable results without damaging the equipment or appliance.

A **Suitably Trained Person** can carry out visual inspections of portable electrical appliances and leads.

A Suitably Trained Person will have attended a training course organised by Academy after which they will be issued with a certificate, which will be valid for 5 years, at which point a review interview will be arranged.

After the issue of the certificate the Suitably Trained Person will be able to carry out the visual examination of portable electrical appliances.

#### **g) PAT Test Equipment**

PAT test metering equipment shall meet all current standards, be fully calibrated and work in conjunction with dedicated safety testing software to provide complete management information about the appliance including, journal recording of events and actions, asset location tracking, printing of screen information, group changing/register sweeping facilities, library of downloaded information and archiving and retrieval routines, data conversion, etc.

#### **h) Test Records**

Records **must** be maintained of all appliance inspections and safety tests, and any corrective maintenance. It may be convenient to incorporate these results into an existing inventory record system. It is a requirement of the "Electricity at Work Regulations 1989" that these records are retained for the life of the equipment.

#### **i) Test Identification Labels**

Each portable electrical appliance should have an INSPECTION (**in Black**), PASS (**in Green**) or FAIL (**in Red**) label fixed to it after each inspection or test.

## **4. PORTABLE APPLIANCE TESTING PROCEDURE**

### **a) Responsibility for Inspection and Testing**

Responsibility for the introduction and management of this policy and procedure will lie with the departmental Manager.

### **b) Frequency of Testing**

There are no absolute rules regarding how often an item of portable electrical equipment should be inspected or tested. HSE Guidance Notes advise “regular” inspection and testing, this is often seen as a requirement for annual testing. However, circumstances, conditions of use and environmental conditions will vary. The frequency of testing should be determined by risk assessment. The HSE recognises that the majority of electrical equipment used in offices and other low risk environments are not hand held and as such present a low risk of electric shock, therefore, inspection and testing frequencies may reflect this.

### **c) Frequency of Inspection**

Inspection frequency will generally be more frequent than for testing. The HSE has issued the following guidance documents:

- i) The Electricity at Work Regulations 1989 Maintenance of Portable Electrical Appliances – Inspection and Testing
- ii) The Maintenance of Portable Electrical Equipment in Offices, and other Low Risk Sector Premises

The tables shown in Appendix B have been prepared in line with guidance offered by the HSE, and will satisfy many situations of average use. These frequencies can be used until sufficient experience is built up to establish what is appropriate for particular circumstances.

## **5. GENERAL GUIDANCE**

See Appendix B1 attached.

## **6. GUIDANCE FOR OFFICES AND OTHER LOW RISK ENVIRONMENTS ONLY**

See Appendix B2 attached.

## **7. TESTING ELECTRONIC EQUIPMENT**

Concern has been expressed that the use of test equipment which generates high test currents and voltages may damage electronic equipment or corrupt data stored on computer hard disks. Taking into account the circumstances relating to the environment where sensitive electronic and computer equipment will normally be used, how it is used and the fact that this type of appliance is, in the main, moved only infrequently, The academy accepts that safety testing may be restricted to the appliance power lead and plug, and that visual inspection of the equipment may be the norm, unless the inspection indicates that full testing is necessary. Responsibility for the full testing and internal condition of computers and other associated electronic equipment in the academy mainly rests with ICT Services, who can be contacted via their Help Desk in the event that a concern over the safety of a computer or associated electronic equipment is raised.

Where a full safety test is considered advisable, it is recommended that an earth continuity test at 100mA be undertaken in place of the standard 4/8/25 amp earth bond test. This can only be undertaken with an approved type of test equipment on the subject of which ICT Services can advise.

## **8. DECISION ON TEST TO BE APPLIED**

A competent person shall determine the appropriate method of test when first examining each new appliance. The test method should be clearly recorded to avoid the risk of applying an incorrect test.

## **9. ADVISED PROCEDURE FOR THE SAFETY TESTING OF “PORTABLE” ELECTRICAL EQUIPMENT**

Portable equipment is defined as any item of electrical equipment that is connected to a standard 240V ac supply via a plug and socket arrangement. The testing of three phase equipment should be discussed with the Facilities Team on extension 162.

### **Inspect the appliance to ensure:**

- That the equipment is not physically damaged
- All covers etc., are in place

### **Inspect the appliance lead to ensure:**

- The insulation is intact and without cracking or fraying
- There are no joins
- It is not badly kinked
- The length of lead is appropriate for the positioning of the appliance
- If readily visible, check that the wiring terminations on the appliance are correctly made. DO NOT remove any covers
- NEVER run cables under carpets or rugs etc

**Inspect the plug to ensure:**

- That it is in good condition without any missing parts. Then remove the cover.
- There are no strands of wire shorting terminals within the plug top or, making an electrical path to the outside of the plug
- That the cable clamp grips firmly the outer insulation of the cable.
- That the fuse is the correct rating for the appliance and bears the A.S.T.A. certification mark

**NB:** If the fuse rating is not marked on the appliance, check the equipment data label for details of the appliance electrical loading in watts; this is marked with a “W”.

**WATTAGE FUSE RATING**

Up to 500W 3 Amps

500W to 1000W 5 Amps

1000W to 3000W 13 Amps

If in doubt consult The Electrical Engineers on Ext. 56886.

Where a new 13A plug is required it **MUST** be a safety plug, to current British Standards, which incorporates partially shielded live & neutral pins.

**Ensure the wiring connections are firmly and correctly made:**

**LIVE** - BROWN

**NEUTRAL** - BLUE

**EARTH** - GREEN/YELLOW

See also: Appendix E - Typical Terminal Connections to a Standard 13A Plug Top

Some imported equipment may have non-standard wiring – consult the Electrical Engineers on Ext. 56886 and ensure that the cables are tagged for future reference.

Owing to high-test voltages, the apparatus under test should be on an insulated work surface and, must not be touched while the test is in progress.

- Proceed with the test, carefully follow the instructions supplied with the tester
- A record of each test must be kept.

**NB:** Treat detachable leads as a separate item of equipment, test accordingly and tag for ease of identification in future.

- The appropriate green/red (positive/negative) sticker must be affixed to each item after the test
- If the test result is negative, the equipment must be withdrawn from use.
- Following successful repair of an appliance, it must be examined and re-tested by a competent person before being returned to use

The responsibility of the competent person or suitably trained person will be limited to carrying out the tests in the manner prescribed by the manufacturers of the test equipment and for recording the results. They bear no further responsibility for the safety or otherwise of an appliance which had been tested in the prescribed manner and had achieved a positive result.



**APPENDIX 'A'**

**PAT INVENTORY FORM**

Dept/Team: \_\_\_\_\_

Manager: \_\_\_\_\_

Date: \_\_\_\_\_

Appliance Description	Location & User	ID Code (if applicable)	Date of visual inspection & by whom	Date of full PAT test & by whom	Pass (P), Fail (F) Repair (R) Scrapped (S)	Date of next visual inspection / full PAT test	Comments

## **APPENDIX 'B'**

### **GUIDANCE ON FREQUENCY OF INSPECTION AND TESTING**

The Tables below have been prepared in line with guidance provided by the HSE and will therefore satisfy many situations of average use. The frequencies suggested may be followed until sufficient experience is built up to establish what is appropriate for specific circumstances.

#### **B1 - GENERAL GUIDANCE**

<b>Type of Business</b>	<b>Visual Inspection</b>	<b>Full PAT Test</b>
Hired Equipment	Time of issue/return	Before issue
Construction/Maintenance/Contract Cleaning	Daily	3 Monthly
Industrial (Heavy/Regular Use)	Before use	6 Monthly
Public Occupation/Use	3 - 6 Monthly	12 Monthly
Commercial (Light/Intermittent Use)	12 Monthly	Biannually

## B2 - GUIDANCE FOR OFFICES & OTHER LOW RISK ENVIRONMENTS ONLY

Equipment/ Environment	User Check	Visual Inspection	Inspection Testing	ACADEMY Procedure
Battery operated < 20 volts	None	None	None	N/A
Extra low voltage < 50 volts AC	None	None	None	N/A
IT Equipment, PC's/VDU's etc.	None	Yes 2-4 Years	Yes Up to 5 years	High use/safety control equipment to be inspected and tested annually.
Photocopiers/Faxes	No	Yes 2-4 Years	Yes Up to 5 years	Usually under maintenance contracts, but inspected and tested every four years regardless.
Double insulated (not hand held e.g. projectors, fans, table lamps etc. (moved occasionally).	No	Yes 6 months - 1 year	Yes 1 - 2 Years	Inspected annually and tested biannually.
Double insulated (hand held) e.g. floor cleaners, kettles etc. (moved regularly)	Yes	Yes 6 months - 1 year	Yes 1 - 2 Years	Inspected six monthly and tested annually.
Earthed equipment (Class 1), some floor cleaners and kettles etc.	Yes	Yes 6 months - 1 year	Yes 1 - 2 Years	Inspected six monthly and tested annually.
Leads, plugs and extensions	Yes	Yes 6 months - 1 year	Yes 1 - 2 Years	Inspected six monthly and tested annually.
Plug in RCD's	-	-	-	Should accompany the appliance it is used in conjunction with and be inspected and tested at the same time.
Equipment in teaching areas (regular use)	No	Yes 3 - 6 months	12 monthly	Annual inspection. Biannual testing.
Residential accommodation (ACADEMY owned equipment)	No	Yes 6 months - 1 year	Yes 1 - 2 Years	Inspected and tested annually.
Privately owned equipment (user responsible)	Yes (by owner)	No	No	Inspected and test prior to first use, therefore inspected and tested annually, but no records kept with the exception of tagging/markings the equipment

**Note:**

Inspection and testing should also be carried out:

- a) When there is reason to suspect the equipment is faulty or damaged, but visual inspection cannot confirm this.
- b) After any repair, modification or similar work to equipment.

## **APPENDIX 'C'**

### **USER EQUIPMENT CHECKLISTS**

The vast majority of faults on electrical equipment can be detected visually. The Academy operates a system of PAT testing which includes both documented, formal visual checks and electrical tests using a PAT testing meter.

PAT testing is carried out at specific intervals. Each piece of equipment will have a sticker on it indicating the date it was last tested and the date that it is due for retest. However, as a user of electrical equipment, it is also important that you visually check the equipment is in good condition before using it.

1 - These checks should include the following:

- Has the equipment been PAT tested and is this test still current?
- Is there damage to the cable, such as cuts, fraying, taped joints?
- Is the plug damaged, is the casing cracked or the plug pins bent?
- Is the outer sheath of the cable effectively secured where it enters the plug and the equipment? (If the coloured insulation of the internal cables are showing, the equipment must not be used.)
- Is there evidence of overheating (burn marks or discoloration)?
- Is there any damage to the external casing of the equipment or are there some loose parts or screws?
- Does the appliance work and switch on/off properly?
- Is the equipment suitable for the job and the environment?

These checks also apply to extension leads and sockets.

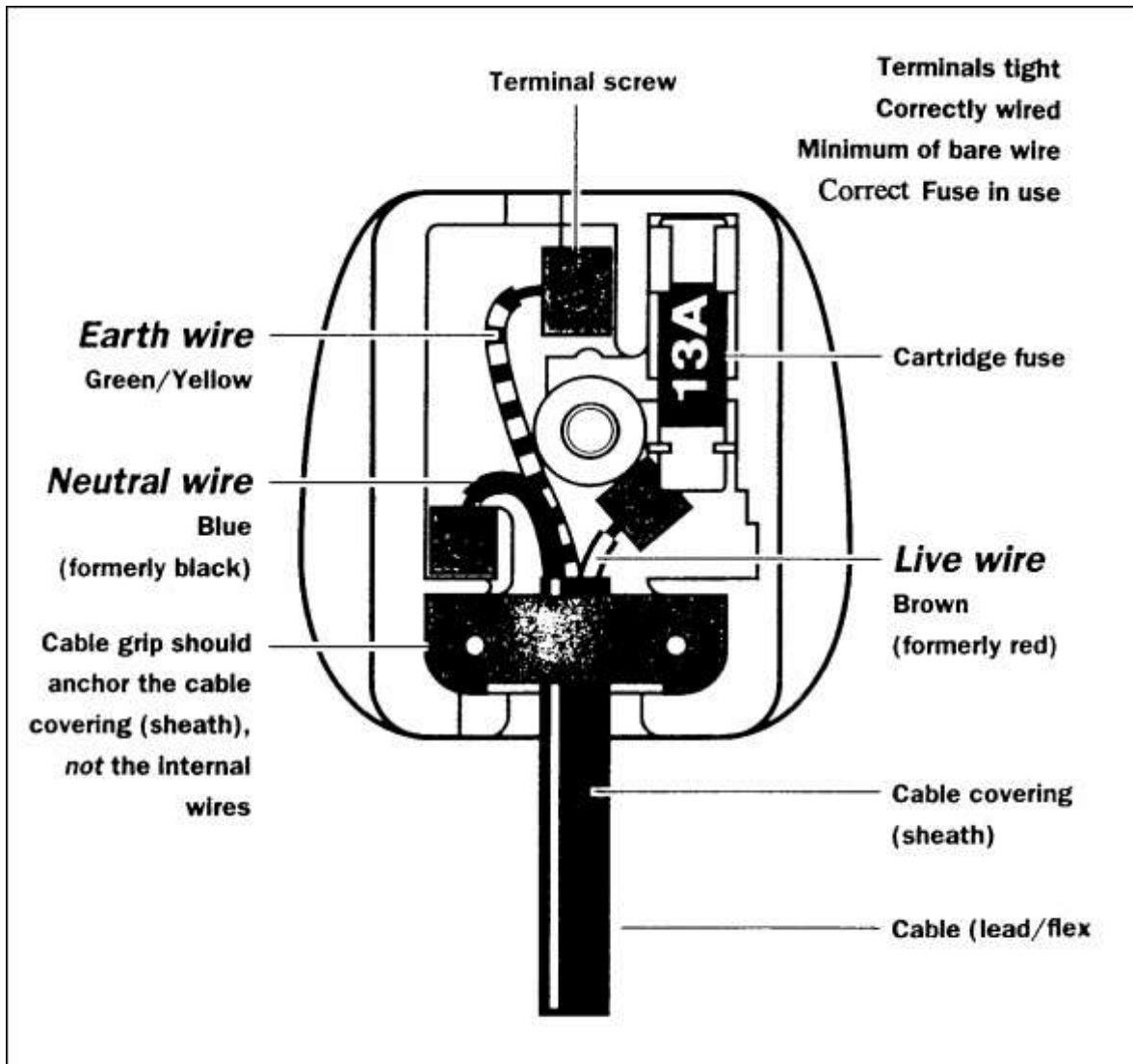
Any faults should be reported to your line manager, supervisor or responsible person. The equipment must be taken out of use immediately; and labelled as faulty. If considered necessary the plug should also be removed. The equipment should not be used until it is repaired and then tested by a competent person.

Ensure cables are not squashed under furniture or boxes, and do not put cables underneath carpets or rugs.

Where extension cables or extensions in drum reels are in use, ensure the equipment is not overloaded - check the information on the extension cable and ensure the required current (amperes) does not exceed the quoted figures.

# APPENDIX 'E'

## TYPICAL TERMINAL CONNECTIONS TO A STANDARD 13A PLUGTOP



## **APPENDIX 'F'**

### **DISPOSING OF WASTE ELECTRICAL AND ELECTRONIC EQUIPMENT**

The Waste Electrical and Electronic Equipment (WEEE) Regulations 2006 relate to buying and disposing (collection, treatment and recycling) of all electrical equipment.

Before replacing electrical equipment

- Think about the environmental consequences before deciding to replace equipment.
- Is it essential to buy a new product or can the equipment be upgraded by a reputable company?
- Can a suitable, safe refurbished product be purchased from a reputable supplier instead?
- If the equipment is in good, safe working order, can it be used by anyone else instead of throwing it away?
- If equipment is sold or given away, it is important to ensure that it is in a good, safe condition. This is because the Academy will have a duty of care and there could be liability implications if an accident was to occur as a result of an existing, fault on this equipment. Consequently, any operating manuals must also be passed on and copies of maintenance and service logs. A copy of this information should also be kept by the vendor/benefactor as evidence.

#### **Responsibilities for establishments**

WEEE should be separated from the main waste stream and not combined with the general waste in bins or skips. The duty of care for waste including safe storage and disposal also extends to WEEE.

If the electrical equipment was bought before 13 August 2005 and is replaced with new equipment fulfilling the same function, then the Producer of the new equipment is responsible for collecting, treating and recycling the old equipment, regardless of whether or not they were the original manufacturer.

The equipment need not be identical and can be equipment that fulfils the same function, taking account of technological developments and improvements in functionality, such as replacing a video player with a DVD player.

The Purchaser must be able to show evidence that the equipment was sent to an accredited re-processor. Producer compliance schemes should provide the establishment with this evidence.

#### **Equipment bought before 13 August 2005**

Where the electrical equipment was bought before 13 August 2005 and no similar product is bought to replace it, contact either Facilities Management who for County Hall only will then recycle it appropriately via their waste disposal contract, or for external establishments a licensed disposal contractor who will for a fee, recycle it appropriately (in accordance with the WEEE Regulations and existing waste management legislation, including the duty of care and the Hazardous Waste Regulations.)

The establishment must be able to show evidence that the equipment was sent to an accredited re-processor, via the formal system of transfer notes required under the duty of care.

## **Equipment bought after 13 August 2005**

When electrical equipment bought after 13 August 2005 is no longer needed, the Producer of the equipment is responsible for collecting, treating and recycling it, unless the establishment agrees to take on this responsibility at the time of the sale.

The Regulations allow Producers and the Purchaser to agree 'alternative arrangements', where the Purchaser may agree to take on some or all of the future costs of the end-of-life treatment of the equipment. This is a commercial decision and is likely to form part of the normal negotiating processes for supply contracts in the future.

If electrical products are bought from a distributor or other intermediary, the Purchaser must get and keep the Producer's registration number for the equipment, as this will be required to arrange disposal at the end of its life. Suppliers of electronic and electrical equipment should always be able to provide this on behalf of the Producers.

If the Producer is responsible for WEEE disposal, Purchasers must establish whether it is the Producer or the Producer's compliance scheme who will be arranging disposal and how this will take place.

Where equipment is leased or rented, the Producer is usually responsible for its disposal.

### **Collection arrangements**

WEEE from the Purchaser may be collected by the obligated Producer or the compliance scheme working on its behalf. WEEE may either be collected directly from the Purchaser's premises or the Purchaser may be asked to take it to a local collection facility, which should be easily accessible.

### **If the Producer goes out of business**

Current guidance is that if the Producer goes out of business during a compliance period for which they have paid the fee to the compliance scheme, the scheme has a responsibility for taking the WEEE. However, if the Producer has gone out of business and it is in another compliance period for which no fee has been paid then the responsibility will fall on the Purchaser.

### **Producer compliance schemes**

The Department for Trade and Industry (DTI) requires all Producers to be registered with a WEEE compliance scheme. A list of Producer compliance schemes is available on the Environment Agency website:

<http://www.environment-agency.gov.uk/weee>

Each compliance scheme will register its members with the Environment Agency. Compliance schemes carry out physical recovery and recycling activities, and discharge these obligations on behalf of their members by sending WEEE to approved authorised treatment facilities (AATFs) or to authorised exporters (AEs).



## APPENDIX 'G'

### GENERAL ADVICE ON EXTENSION LEADS AND ADAPTORS

Multi-adaptor plugs should preferably not be used, because they can cause damage to sockets and also present a potential fire risk if overloaded. They are usually available as 2 or 4 way socket types and if they are used must be the type that require a suitable fuse to be fitted.

Using extension leads should be avoided if possible, and additional permanent sockets provided instead. Where extension leads are unavoidable, or are used temporarily until additional sockets are fitted, in order to prevent trip hazards, do not use an extension lead any longer than necessary.

Coiled drum extension leads should not be used because they need to be fully unwound to prevent overheating and this can create trip hazards.

Extension leads must never be daisy-chained (one extension lead plugged into another).

Only extension leads that consist of 3-core cable should be used, even if it is being used with a class 2 (double insulated) appliance. This is to prevent possible danger if the extension lead is ever used for a class 1 appliance in the future. Any extension leads found without an earth wire should be marked as defective and removed from service.

#### Maximum length of leads

The length of the extension lead should not exceed the following (based on guidance from the IET) Conductor Surface Area (CSA)/ Maximum Length:

1.25 mm <sup>2</sup> .....	12 m
1.50 mm <sup>2</sup> .....	15 m
2.50 mm <sup>2</sup> .....	25 m

2.5 mm<sup>2</sup> cables are usually too large to fit in standard 13A plugs, but they may be used with BS4343 (BS EN 60309-2) industrial plugs.

If extension leads longer than the above are used, the IEE recommend they must be protected by a 30mA residual current device (RCD). A lead of this length will also possibly make controlling trip hazards more difficult.

Long extension leads designed for the home rather than the workplace are sold very cheaply through DIY stores, and can find their way into workplaces. Although these are sold legally in the UK, as they are being sold for a consumer market, rather than an industrial one, they may fail to meet the above criteria of cross sectional area and length.

If extension leads are found in the Academy that do not meet the criteria shown in the previous table, they must be taken out of use immediately and replaced with ones that do comply.